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CAREERS OF DANGER
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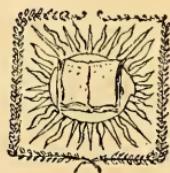


"DIVERS AT WORK NEAR A WRECK."

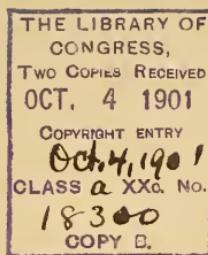
CAREERS OF DANGER AND DARING

BY
CLEVELAND MOFFETT

WITH ILLUSTRATIONS BY
JAY HAMBIDGE AND GEORGE VARIAN
AND OTHERS



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Dedication

I DEDICATE THIS BOOK TO
MY TWO LITTLE CHILDREN
ANNE EUNICE
AND
CLEVELAND LUSK
IN LOVE AND THE HOPE THAT
IT MAY HELP THEM, AS THEY
GROW UP, TO FORM HABITS OF
COURAGE AND USEFULNESS.

AUGUST, 1901. C. M.

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CAREERS OF DANGER
AND DARING



CAREERS OF DANGER AND DARING



THE STEEPLE-CLIMBER

I

IN WHICH WE MAKE THE ACQUAINTANCE OF
“STEEPLE BOB”

DURING the summer months of 1900—what blazing hot months, to be sure!—people on lower Broadway were constantly coming upon other people with chins in the air, staring up and exclaiming: “Dear me, is n’t it wonderful!” or “There’s that fellow again; I’m sure he ’ll break his neck!” Then they would pass on and give place to other wonderers.

The occasion of this general surprise and apprehension was a tall man dressed entirely in white, who appeared day after day swinging on a little seat far up the side of this or that church steeple, or right at the top, hugging the gold cross or weather-vane, or, higher still, working his way, with a queer, kicking, hitching movement, up various hundred-foot flagpoles that rise from the heaven-challenging office buildings down near Wall Street. At these perilous altitudes he would hang for hours, shifting his ropes occasionally, raising his swing or lowering it, but not doing anything that his sidewalk audience could see very well or clearly understand. Yet thousands watched him with fascination, and a kodak army descended upon neighboring rooftops, and newspapers followed the movements of “Steeple Bob” in thrilling chronicle.

That is what he was called in large black letters at the head of columns—"Steeple Bob"; but I came to know him at his modest quarters on Lexington Avenue, where he was plain Mr. Merrill, a serious-mannered and an unpretentious young man, very fond of his wife and his dog, very fond of spending evenings over books of adventure, and quite indifferent to his day-time notoriety. I call him a young man, yet in years of service, not in age, he is the oldest steeple-climber in the business, ever since his teacher, "Steeple Charlie," fell from his swing some years ago in New Bedford, Massachusetts, and died the steeple-climber's death.

I often saw books of the sea on Merrill's table, and accounts of whaling voyages; and he told me, one evening (while through an open door came the snores of his weary partner), about his own adventurous boyhood, with three years' cruising in Uncle Sam's navy on the school-ships *Minnesota* and *Yantic* (he shipped at the age of twelve) and two years at whale-fishing in the North Sea. Quite ideal training, this, for a steeple-climber; he learned to handle ropes and make them fast so they would stay fast; he learned to climb and keep his head at the top of a swaying masthead; he learned to bear exposure as lads must who are washed on deck every morning with a hose, and stand for inspection, winter and summer, bare to the waist. And he gained strength of arm and back swinging at the oar while whale-lines strained on the sunk harpoon; and patience in long stern-chases; and nerve when some stricken monster lashed the waters in agony and the boat danced on a reddened sea.

Merrill laughed about the climb up old Trinity's spire, the first climb when he carried up the hauling-rope and worked his way clear to the cross, with nothing to help him but the hands and feet he was born

with, and did it coolly, while men on the street below turned away sickened with fear for him.

"I 'm telling you the truth," said Steeple Bob, "when I say it was an easy climb; any fairly active man could do it if he 'd forget the height. I 'm not talking about all steeples—some are hard and dangerous; but the one on Trinity, in spite of its three hundred-odd feet, has knobs of stone for ornament all the way up (they call them corbels), and all you have to do is to step from one to another."

"How much of a step?"

"Oh, when I stood on one the next one came to my breast, and then I could just touch the one above that."



"I HAD TO CRAWL AROUND AND OVER IT."

He called this easy climbing!

"The only ticklish bit was just at the top, where two great stones, weighing about a ton apiece, swell out like an apple on a stick, and I had to crawl around and over that apple, which was four feet or so across. If it had n't been for grooves and scrollwork in the stone I could n't have done it, and even as it was I had two or three minutes of hard wriggling after I kicked off with my feet and began pulling myself up."

"You mean you hung by your hands from this big ball of stone?"

"I hung mostly by my fingers; the scrolls were n't deep enough for my hands to go in."

"And you drew yourself slowly up and around and over that 'ball'?"

"Certainly; that was the only way."

"And it was at the very top?"

"Yes, just under the cross. It was n't much, though; you could do it yourself."

I really think Merrill believed this. He honestly saw no particular danger in that climb, nor could I discover that he ever saw any particular danger in anything he had done. He always made the point that if he had really thought the thing dangerous he would n't have done it. And I conclude from this that being a steeple-climber depends quite as much upon how a man thinks as upon what he can do.

"A funny thing happened!" he added. "After I got over this hard place, I slid into a V-shaped space between the bulging stone and the steeple-shaft, and I lay there on my back for a minute or so, resting. But when I started to raise myself I found my weight had worked me down in the crotch and jammed me fast, and it was quite a bit of time before I could get free."

"How much time? A minute?"

"Yes, five minutes; and it seemed a good deal longer."

Five minutes struggling in a sort of stone trap, stretched out helpless at the very top of a steeple where one false move would mean destruction—that is what Merrill spoke of as a funny thing! Thanks, I thought, I will take my fun some other way, and lower down.

"You would be surprised," he went on, "to feel the movement of a steeple. It trembles all the time, and answers every jar on the street below. I guess old Trinity's steeple sways eighteen inches every time an elevated train passes. And St. Paul's is even worse. Why, she rocks like a beautifully balanced cradle; it would make some people seasick. Perhaps you don't know it, but the better a steeple is built the more she sways. You want to look out for the ones that stand rigid; there's something wrong with them—most likely they're out of plumb."

"Is n't there danger," I asked, "that a steeple may get swaying too much, say in a gale, and go clear over?"

"Gale or not," said Merrill, "a well-made steeple must rock in the wind, the same as a tree rocks. That is the way it takes the storm, by yielding to it. If it did n't yield it would probably break. Why, the great shaft of the Washington Monument sways four or five feet when the wind blows hard."

Then he explained that modern steeples are built with a steel backbone (if I may so call it) running down from the top for many feet inside the stonework. At Trinity, for instance, this backbone (known as a dowel) is four inches thick and forty-five feet long, a great steel mast stretching down through the cross, down inside the heavy stones and ornaments,

and ending in massive beams and braces where the steeple's greater width gives full security.

"What sort of work did you do on these steeples?" I asked.

"All kinds; stone-mason's work, painter's work, blacksmith's work, carpenter's work—why, a good steeple-climber has to know something about 'most every trade. It's painting flagpoles, and scraping off shale from a steeple's sides, and repairing loose stones and ornaments, and putting up lightning-rods, and gilding crosses, and cleaning smoke-stacks so high that it makes you dizzy to look up, let alone looking down, and a dozen other things. Sometimes we have to take a whole steeple down, beginning at the top, stone by stone—unless it's a wooden steeple, and then we burn her down five or six feet at a time, with creosote painted around where you want the fire to stop; the creosote puts it out. Once I blew off the whole top of a steeple with dynamite; and, by the way, I'll tell you about that some time."

Conversing with a steeple-climber (when he feels like telling things) is like breathing oxygen; you find it over-stimulating. In ten minutes' matter-of-fact talking he opens so many vistas of thrilling interest that you stand before them bewildered. He starts to answer one question, and you burn to interrupt him with ten others, each of which will lead you hopelessly away from the remaining nine.

"Did you ever have any experiences with lightning?" I asked Merrill, one day.

"Oh, a few," he said. "A thunderbolt struck the Trinity steeple the very day we finished our work. We had just taken down our tackle and staging after gilding the cross when—by the way, they say there's a hundred dollars in gold under that cross."

"Really?" I exclaimed. "How did it get there?"

"Somebody ordered it put there when the steeple was built. People often do queer things like that. I painted a flagpole on a barn up in Massachusetts where there was four hundred dollars in gold hidden under the weather-vane. Everybody knew it was there, because the farmer who put it there told everybody, and my partner was crazy to saw off the end of that pole some night and fool 'em, but of course I would n't have it."

Here was I quite off my thunderbolt trail, and although curious about that farmer, I came back to it resolutely.

"Well," resumed Merrill, "this lightning stroke came down the new rod all right until it reached the bell-deck, and there it circled round and round the steeple four or five times, wrapping my assistant in bluish-white flame. Then it took a long jump straight down Wall Street, smashed a flagpole to slivers, and vanished. Say, there are things about lightning I 've never heard explained. I know of a steeple-climber, for instance, who was killed by lightning—it must have been lightning, although no one saw it strike. There were two of them working on a scaffolding when a thunder-storm came up, and this man's partner started for the ground, as climbers with any sense always do. But this fellow was lazy or out of sorts or something, and said he would n't go down, he 'd stay on the steeple until the storm was over. And he did stay there, without getting any harm, so far as anybody on the ground could see, except a wetting. Just the same, when his partner went up again, he found him stretched out on the scaffolding, dead."

"Frightened to death?" I suggested.

Merrill shook his head. "No, they said it was light-



AT THE TOP OF ST. PAUL'S, NEW YORK.

ning; but it 's queer how lightning could kill a man without being seen, is n't it?"

Then Merrill gave an experience of his own with a thunderbolt. It was during this same busy summer of 1900, while he and his partner were scraping the great steel smoke-stack that rises from ground to roof along one side of the American Tract Society Building, that towering structure which looks down with contempt, no doubt, upon ordinary church steeples.

"We were in our saddles," Merrill explained, "swung down about two thirds of the smoke-stack's length, when some black clouds warned us of danger, and we hauled ourselves up to the roof. My partner, Walter Tyghe, got off his saddle and stood there where my wife was waiting (she often goes to climbing-jobs with me—she 's less anxious when she can watch me); but I thought the storm was passing over, and kept on scraping, sort of half resting on the cornice, half on my saddle. Suddenly a bolt shot down from a little pink cloud just overhead, and splintered a big flagpole I had just put halyards on, and then jumped past us all so close that it knocked Walter over, and made me sick and giddy so that I fell back limp on my saddle-board, and swung there helpless until my wife pulled the trip-rope that opens the lock-block and drew me in from the edge. That 's not the first time she 's been on deck at the right minute. Once she came up a steeple to tell me something, and found the hauling-line smoldering from my helper's cigarette. If that line had burned through it would have dropped me to the ground from the steeple-top, saddle, lock-block, and all. The man with the cigarette was so scared he quit smoking for good and all."

Here, in reply to my question, Merrill explained the working of a lock-block, which is simply a pulley that

allows a rope to pass through it, but will not let it go back. With this block the steeple-climber can

be hauled up easily, but cannot fall, even if the man hauling should let go the rope. When it is necessary to descend, a pull on the trip-rope releases a safety-catch and the saddle goes down.

"Do steeple-climbers always work in pairs?" I asked him.

"Usually. It would be hard for one man to do a steeple alone. There are lots of places where you must have some one to fasten a rope or hold the end of a plank or

pass you something. Besides, it would n't be good for a man's mind to be spending days and days upon steeples all alone. It's bad enough with a partner to talk to. That makes me

"*"THEN MY PARTNER STOOD ON MY SHOULDERS."*"



"*"THEN MY PARTNER STOOD ON MY SHOULDERS."*"

Dan O'Brien. If I had n't been up with him one day—" Merrill checked himself and changed the subject.

"I 'll give you a case where a man alone could never have done the thing, I don't care how clever a steeple-climber he might be. It was on St. Paul's, New York, after we had finished the job and taken everything down. Then somebody noticed that the weather-vane on top of the ball was n't turning properly. I knew in a minute what the matter was; it was easy enough to fix it, but the thing was to reach the weather-vane. I don't mean that the climb up the steeple was anything; we had done that before; but if I tried to climb around that big ball again (it was the same sort of a wriggling business as that over the bulging stones at Trinity) I would be sure to scrape off a lot of the fine gilding we had just put on. And yet I could n't get at the weather-vane without getting over the ball. I studied quite a while on this little problem, and solved it with my partner's help. We both climbed the steeple as far as the ball; we went up the lightning-rod; then we roped ourselves on the steeple-shaft by life-lines, and then my partner, that was Joe Lawlor, stood on my shoulders and did the job. You see it was easy enough that way."

"Easy enough!" Think of it! Two men clinging to the point of a steeple. One of them braces himself with the toes of his rubber shoes in crannies of the stone, and the other, balancing on his shoulders like a circus performer, does a piece of work, no matter what, with a reeling abyss all around (what is looking over a precipice compared to this?), and all the time the spire swaying back and forth like a forest tree. And then you hear that, instead of getting a large sum for such an achievement, these men, taking it through the year, get scarcely more than ordinary workmen's wages.

II

HOW THEY BLEW OFF THE TOP OF A STEEPLE WITH DYNAMITE

KOWN over all Connecticut was the Congregational Church in Hartford, that stood for years on Pearl Street, and was famous alike for the burning words spoken beneath its roof, and the tall, straight spire that reached above it; two hundred and thirty-eight feet measured the drop from cross to pavement. But churches pass like other things, and near the century-end came the decision by landowners and lease interpreters that this graceful length of brownstone and the pile beneath it must move off the premises, which meant, of course, that the steeple must come down, the time appointed for this demolition being August, 1899.

Now, the taking down of a steeple two hundred and thirty-eight feet high, that rises on a closely built city street, is not so simple a proceeding as might at first appear. If you suggest pulling the steeple over, all the neighbors cry out. They wish to know where it is going to strike. Are you sure it won't smash down on their housetops? Can you make a steeple fall this way or that way, as woodmen make trees fall? How do you know you can? Besides, how are you going to hitch fast the rope that will pull it over? And who will climb with such a rope to the steeple-top? It must be said that there is usually some young man at hand, some dare-devil character of the vicinity, who is ready

to try the thing and is positive he can succeed at it. But, luckily, he seldom gets a chance to try.

"It's queer," said Merrill, telling me the story, "how people ever built a steeple like this one without a window in it, or an air-passage, or anything for ventilation. Between the bell-deck and the cross there was n't a single opening from the inside out, so I had to break my way through up near the top. What a place for a man to work, squeezed in the point of a stifling funnel, with no swing for his hammer, and no air to breathe, and the scorch of an August sun! After fifteen minutes of it, my wrists and temples would be pounding so I'd have to come down and rest.

"Of course the purpose of this hole that I knocked through the steeple-top was to make fast ropes and pulleys, so my partner and I could hoist ourselves along the outside, and not have to climb up the inside cross-beams, which, I can tell you, is a lively bit of athletics. Well, we got our ropes fixed all right, about twenty-five feet below the top, and the 'bosun's saddle' swung below for us to travel up and down in, and then we made fast another set of ropes and pulleys about fifteen feet higher up; this was for hoisting timber and stuff that we needed."

"How did you get up that fifteen feet?" I inquired.

"Worked up on the stirrups—that is, two nooses around the steeple, each ending in a loop, one for the right foot, one for the left. You stand in the right stirrup and work the left loop up, then you stand in the left stirrup and work the right loop up. Sometimes in hard places you have to throw your nooses around the shaft as a cowboy casts a rope. Come down some day and watch us work; you'll see the whole thing."

To this invitation I gave glad acceptance; I certainly wished to see this stirrup-climbing process.

"The next thing," continued Merrill, "was to make another hole in the steeple through a keystone a little

below our first hole. In this hole we set a block of Norway pine resting on an iron jack. The block was about a foot square and twenty-two inches high, a big tough piece, you see, and by screwing up the jack we could make that part as solid as the keystone was. We made this hole on the east side of the steeple, which was the side we wanted her to fall on, the only side she could fall on without injuring something; and we had it figured out so close that we dug a trench on that side straight out from the steeple's base, ten feet wide and four feet deep, and told people we intended to have the whole top of that steeple, say a length of thirty-five feet and a weight of

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of thirty-five feet and a weight of

thirty-five tons, come off at one time and land right square in that trench and nowhere else. That 's what we intended to do.

"Now began the hoisting of materials; first a lot of half-inch wire cable, enough for four turns around the steeple, then eight sixteen-foot timbers, two inches thick and a foot wide, then a lot of maple wedges. We bandaged the steeple with the cable and drew it tight with tackle. Then we lowered the timbers lengthwise inside the cable, which we could do because the steeple was an octagon with ornamented corners, and these left spaces where the wire rope was stretched around. Then we wedged fast the eight timbers so that they formed a sixteen-foot half-collar on the west side of the steeple just opposite our hole where the jack was. In other words, we had the steeple shored in so that when we let her go no loose stones could fall on the west side; everything must fall to the east.

"Last of all, we widened our hole on the east side, stripping away stones until that whole side lay open in a half-circular mouth about four feet high. And in this mouth were two teeth, one might say, that held the stone jaws apart, the iron jack biting into the block of Norway pine. On those two now came the steeple's weight, or, anyhow, one half of it. To knock out one of these teeth would be to leave the east side of the steeple unsupported, with the result that it must topple over in that direction and fall to the ground. Anyway, that was our reasoning, and it seemed sound enough; the only question was how we were going to knock out that block of Norway pine.

"Well the day of the test came, and I guess five thousand people were there to see what would happen. Everybody was discussing it, and farmers had driven in for miles just as they do for a hanging. You under-

stand I was under the orders of the contractor, and he had his own plan about getting the block out. He proposed to hitch a rope to it, drop this rope to a donkey-engine in the yard, and set the engine winding up the rope. He said the block would have to come out then and the steeple fall. I agreed that the block might come out, but was afraid it would tip up through the strain coming at an angle, and throw the steeple over to the west, just the way we did n't want it to go. And if that steeple ever fell to the west, there was no telling how many people it would kill in the crowd, without counting damage to houses.

"However, the contractor was boss, and he stuck to it his way was right, so we hitched the engine to the block and set her going. She puffed and tugged a little, and then snapped the rope. We got another rope, and she broke that too. Then we got a stronger rope, and the engine just kicked herself around the yard and had lots of fun, but the block never budged. All that morning we tried one scheme after another to make that engine pull the block out, but we might as well have hitched a rope to the church; the steeple's weight was too much for us. And all the time the crowd was getting bigger and bigger, until the police could hardly manage it.

"Finally the contractor, being very mad and quite anxious, said he 'd be hanged if he could get the block out, and for me to try my scheme, and do it quick, for some men were going about saying the thing was dangerous and ought to be stopped. He did n't have to speak twice before I was on my way up that steeple carrying an inch auger, a fifty-foot fuse, and a stick of dynamite—I 'd had them ready for hours. It 's queer how people get wind of a thing; the crowd seemed to know in a minute that I was going to use dynamite, and before I was twenty feet up the ladder

a police officer was after me, ordering me down. I went right ahead, pretending not to hear, and when I got to the bell-deck he was puffing along ten yards below me. I swung into my 'bosun's saddle' and began pulling myself up outside the steeple, and I guess the whole five thousand people around the church bent back their heads to watch me.

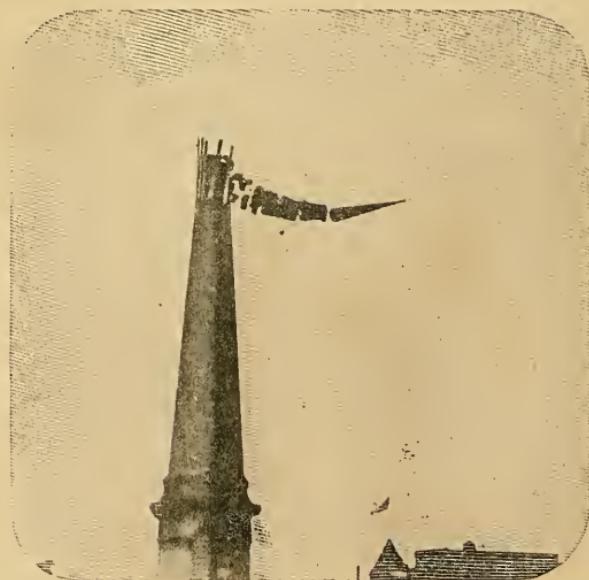
"As soon as I began to rise in the saddle I knew I was all right, for I coiled up the hauling-line on my arm so the officer could n't follow me. All he could do was stand on the bell-deck and gape after me like the rest and growl.

"When I reached the block I bored a six-inch hole into her at a downward slant, and in this I put some crumbs of dynamite,—not much, only about half a tea-spoonful,—and then I stuck in the fuse and tamped her solid with sand. Then I lit the other end, dropped it down inside the steeple, and slid down the rope as fast as I could, yelling to the officer that I 'd touched her off. You ought to have seen him get out of that steeple! He never waited to arrest me or anything; he had pressing business on the ground!

"By the time I got down you could see a little trail of bluish smoke drifting away from the hole, and there was a hush over the crowd, except for the police trying to make them stand back behind the ropes. I don't know as I ever saw a bigger crowd; the street was jammed for blocks either way. Well, sir, that was a queer acting fuse. It smoked and smoked for about ten minutes, and then the smoke stopped. The people began to laugh—they said it had gone out; and the contractor was nearly crazy: he was sure I had made another failure. I did n't know what to think; I just waited. We waited ten minutes, twelve minutes; it seemed like an hour, but nobody dared go up to see what the matter was. Then suddenly the explosion

came—no louder than a pistol-crack, for dynamite is n't noisy, but it stirred me more than a cannon.

“‘Start your engine!’ I shouted, and the little dummy had just time to wind up half a turn of the hitch-line when the old steeple-top swayed and broke clean in two, right where the block was, and the whole upper length fell like one piece, fell to the east just as we had planned it, and landed in the trench, every stone of it; there was n't a piece as big as your finger-nail, sir, outside that trench. And while she was falling I don't know how many kodaks were snapped in the hope of getting a picture; men and women with cameras had been waiting for hours on the roofs of high buildings, and two or three of them actually caught a picture of the steeple-top as it hung in the air for a fraction of a second at right angles to the base.”



PICTURE OF THE FALLING STEEPLE, PHOTOGRAPHED JUST AFTER THE DYNAMITE EXPLODED. THE FALLING SECTION WAS 35 FEET IN LENGTH AND WEIGHED 35 TONS.

III

THE GREATEST DANGER TO A STEEPLE-CLIMBER LIES IN BEING STARTLED

IT appears that professional steeple-climbers are quiet-mannered men, with a certain gentleness of voice (like deaf people) that impresses one far more than any strident boasting. This habit of silence they form from being silent so much aloft. And when they do speak it is in a low tone, because that is the least startling to a man as he swings over some reeling gulf. Next to an actual disaster (which usually kills outright and painlessly) what a steeple-climber most dreads is being startled. This was explained to me in one of our many talks by "Steeple Bob," famous over the land for daring feats, but never reckless ones. How plainly I call up his pale, serious face and the massive shoulders, somewhat bent, and the forearm with muscles to impress a prize-fighter! Pleasant to note that Merrill uses excellent English.

"Did you ever have an impulse to jump off a steeple?" I questioned, recalling the sensations of many people in looking down even from a housetop.

"I 've kept pretty free from that," said he; "but there 's no doubt climbing steeples does tell on a man's nerves. Now, there was Dan O'Brien; he had an impulse to jump off a steeple one day, and a strong impulse, too. He went mad on one of the tallest spires in Cincinnati; right at the top of it."

“Went mad?”

“Yes, sir, raving mad, and I was by him when it happened. I forget whether the church was Baptist or Presbyterian, but I know it stood on Sixth Street, near Vine, and there was a big hand on top of the steeple, with the forefinger pointing to heaven. We were putting fresh gilding on this hand. I was working on the thumb side and O’Brien on the little-finger side, both of us standing on tiny stagings about the size of a chair-seat, and both of us made fast to the steeple by life-lines under our arms. That’s an absolute rule in climbing steeples—never to do the smallest thing unless you’re secured by a life-line. It was coming on dark, and I was hurrying to get the gold leaf on, because we’d given the hand a fresh coat of sizing that would be dry before morning. We had n’t spoken for some time, when suddenly I heard a laugh from O’Brien’s side that sent a shiver down my spine. Did you ever hear a crazy man laugh? Well, if ever you do, you’ll remember it. I looked at him and saw by his face that something was wrong.

“‘What are you doing?’ said I.

“He answered very polite and steady like, but his tone was queer: ‘I’m trying to figure out how long it would take a man to get down if he went the fastest way.’

“I thought I had better keep him in a good humor, so I said: ‘I’ll tell you what, Dan, you brace up and get this gold on, and then we’ll race to the ground in our saddles.’

“‘That’s a fair idea,’ said he in a shrill voice, ‘but I’ve got a better one. We’ll race down without any saddles; yes, sir, without any lines, without a blamed thing.’

“‘Don’t be a fool, Dan. What you want to do

is to get that gold on—quick.' I tried to speak sharp.

" 'No, sir; I 'm going to jump, and so are you.'

"I caught his eye just then and saw it was n't any time to bother about gold leaf. I reached up and eased the hitch of my line around the hand so I could swing toward him. I knew if I once got my grip on him he would n't make any more trouble. But I 'd never had a crazy man to deal with, and I did n't realize how tricky and quick they are. While I was working around to his side and thinking he did n't notice it, he was laying for me out of the corner of his eye, and the first thing I knew he had me by the throat and everything was turning black. I let go of the line and dropped back on my saddle-board helpless, and if it had n't been for blind luck I guess the people down below would have got their money's worth in about a minute. But my hand struck on the tool-box as he pressed me back, and I had just strength enough left to shut my fingers on the first tool I touched and strike at him with it. The tool happened to be a monkey-wrench, and when a man gets a clip on the head with a thing like that he 's pretty apt to keep still for a while. And that 's what O'Brien did. He keeled over and lay there, and I did, too, until my head got steady. Even then I guess we 'd both have fallen if it had n't been for the life-lines.

"The rest was simple enough after I got my senses back. Dan was unconscious, and all I had to do was fasten a rope to him and lower away. They took care of him down below until the ambulance came, and he spent that night in a hospital. And he 's spent most of his years since then in an asylum, his mind all gone except for short periods, when he comes to himself again, and then he always starts out to put an end to

me. That last impulse to destroy me has never left him."

It was after this that I learned about that other danger to steeple-climbers, of being startled. Merrill says that men of his craft, whether they realize it or not, work under constant nervous strain. However calm a steeple-climber may think himself, his body is always afraid, his muscles are always tense, his clutch on ropes and stones is always harder, two or three times harder, than the need is; his knees hug what comes between them so tightly that it hurts, even when they might safely be relaxed. That is the trouble, a steeple-climber cannot relax his body or control its instinctive shrinking. It is not looking down into the gulf around him that he minds (the climber who cannot do that with indifference is unfit for the business); what he sees he can cope with; it is what he cannot see that does the mischief—what he fears vaguely. And a sudden noise, an unexpected movement may throw him into all but panic. So the veteran climber, swinging at the steeple-top opposite his partner, is careful to say in a low tone, "I 'm going to lower my saddle," before he does lower it; or, "I 'm going to strike a match," before he strikes it.

Sometimes a new helper at the hauling-line down on the bell-deck will shift his place from weariness or thoughtlessness, and let the line move up an inch or two, which drops the saddle an inch or two far aloft—drops it suddenly with a jerk. It 's a little thing, yet the climber's heart would not pound harder were the whole steeple falling. Merrill told me that one of his greatest frights came from the simple brushing against his legs of a rope pulled without a word by a careless partner. To Merrill's nerves, all a-quiver, this was not a rope, but some nameless catastrophe to over-

whelm him. He knew only that something had moved where nothing had any business to move, that something had touched him where nothing was. A steeple-climber is like a child in the dark—in terror of the unknown. In all the world, perhaps, there is no one



LOOKING FROM THE GROUND UPWARD AT ST. PAUL'S SPIRE,
BROADWAY, NEW YORK CITY.

so utterly alone as he, swinging hour after hour on his steeple-top. The aeronaut has with him a living, surging creature—his balloon; the diver feels always the teeming life of the waters; but this man, lifted into still air, poised on a point where nothing comes or goes, where nothing moves, where nothing makes a sound—he, in very truth, is alone.

“It’s always the little things that frighten you,” re-

flected Merrill, "not the big things. I 'll give you an instance. When I went up inside St. Paul's steeple the first time (I wanted to inspect the beams, and see how the dowel was anchored) I got into a tight place that might well frighten a man. I got squeezed fast between timbers that fill nearly all the slender top space, and could n't get up or down, but just hung there, breathing air full of dust and calling for help. I called three quarters of an hour before any one came, and then it was only by accident. But I was n't frightened. On the other hand, a day or two later, when I was making fast a rope outside (I was just under the ball that holds the weather-vane) I got a bad start from nothing at all. I had my arms around the spindle of the steeple, making a hitch, and my head pressed against the copper sheathing, when I heard a most unearthly screech. I guess the shock of that thing did me five hundred dollars' worth of harm—shortened my life days enough to earn five hundred dollars in. And what do you think it was? The weather-vane had turned a little in the wind and creaked on its bearings, that 's all. It does n't seem as if that ought to scare a man, does it?"

There was something quite touching, I thought, in the humble frankness of this big-shouldered man. Yes, he had been afraid, he whose business it was to fear nothing, afraid of some squeaking copper, and his face seemed to say that there are things about steeples not so easily explained, things not even to be talked about. And abruptly, as by an effort, he left this part of the subject and told a funny story of his adventures coming home late one night without a key, and getting in by way of the roof and an iron pipe; a simple enough climb had he not been taken for a "purglaire" by an irate German lodger, who appeared in

nightgown and phlegmatic fright, and vowed he would "haf him a revolfer, a skelf-skooter, in the morning."

This effort at diversion turned Merrill into gaiety for a moment, but straightway memory brought back the somber theme.

"I 'll give you another case," said he, changing again abruptly, "where I was n't frightened, but should have been. It was out in Chicago, and two of us were on a staging hung down the front of a clothing factory. We were painting the walls. My partner had made his end of the staging fast, and I had made mine fast. Perhaps if I 'd been longer in the business I would have taken more notice how he secured his rope, for it meant safety to me as well as him, and I knew he 'd been drinking, but I supposed it was all right. Well, it was n't all right; his rope held for three or four hours, and then, at just about eleven o'clock, it slipped, and the staging fell from under us. We were six stories up, and right below were the sidewalk flagstones. That 's the time I ought to have been frightened, but I only said to myself, 'Hello! this thing 's going down,' and caught the window-ledge in front of me. Then I hung there, wondering if I could pull myself up or if any one would come to help me. I called out not very loud, and I was n't excited. Pretty soon I saw I could n't pull myself up, for I had a poor hold with my fingers, and the ledge was smooth stone. Then I saw they 'd have to hurry if they were going to pull me in. Then I did n't care. I—I—"

"You fell?"

He nodded.

"What, six stories down?"

He nodded again. "The thing that saved me was an awning over the sidewalk. Some man across the way saw me hanging from the window, and he ran

over quickly and let the awning down. I 'd like to shake that man by the hand, but I never knew who he was. When I came to myself I was at the hospital done up in plaster, and I stayed there nine months."

"Badly hurt?" I asked, shrinking.

Merrill smiled. "It did n't do me any particular good. I 'm a big, strong fellow now, but I was n't much after that fall. Both my legs were broken. Both my arms were broken. My right shoulder and right wrist were dislocated, and—let 's see. Oh, yes, I had three ribs torn away from the breast-bone."

"And your—"

"My partner? Poor lad! You would n't care to hear how they found him. They laid him away kindly the next day."

He smiled in a sort of appealing way, and then came the worn, wistful look I had noticed, and his forehead lines deepened. I fancy all men who follow steeple-climbing get those strained, anxious eyes.

IV

EXPERIENCE OF AN AMATEUR CLIMBING TO A STEEPLE-TOP

IT came to my knowledge, one bracing day in October, that "Steeple Bob" had agreed to "do" that famous Brooklyn Church of the Pilgrims, with its queer, crooked spire and big brass ball, a landmark from the river on Columbia Heights.

"It 's one of those easy jobs that are the hardest," said Merrill. "If you want to see us use the stirrups come over."

That was exactly what I did want to see, this puzzling stirrup process which allows a man to lift himself by his boot-straps, as it were, up the last and narrowest and most dangerous length of a steeple; so I agreed to be there.

"If you like, you can go up on the swing yourself!" said Merrill, with the air of conferring a favor. I expressed my thanks as I would to a lion-tamer offering me the hospitality of his cages, then asked how he meant that easy jobs are the hardest.

"Why, easy jobs make a man careless, and that gets him into trouble. Another thing, little old churches look easy, but they 're apt to be treacherous. Now, this steeple on the Church of the Pilgrims is built of wood, with loose shingles on it, and a tumble-down iron lightning-rod, and rickety beams, and shaky ladders, and—well, you feel all the time as if you were walking



GILDING A CHURCH CROSS, ABOVE NEW YORK CITY.

on eggs. It 's just the kind of a steeple that killed young Romaine about a month ago."

Of course I asked for the story of young Romaine, and was told of certain climbers who advertise their skill by using a steeple-top for acrobatic feats that have nothing to do with repairing. Upon such Merrill frowned severely.

"Romaine was a fine athlete," said he, "and a fearless man, but he went too far. He would stretch out on his stomach across the top of a steeple, and balance there without touching hands or knees, and he 'd do all sorts of circus tricks on lightning-rods and weather-vanes and flagpoles—anything for notoriety. I told him he 'd get killed sure some day, but he laughed at me. Well, it was n't a week after I warned him when he was killed. He climbed an old lightning-rod without testing it (it was on a little church up at Cold Spring, New York), and just as he was reaching the steeple-top, with a whole town watching him, the end of the rod pulled out, and he swung off with it, ripping out every dowel, like the buttons off a coat, right down to the ground—smash. Poor fellow, when I read the news I left my job at Trinity and took the first train up to bury him."

This sad story lingered in my mind that night, and was there still the next afternoon as I drew near the Church of the Pilgrims to witness the first day's climbing. Already, at a distance, I knew that the men were at work from the upbent heads of people on the street who stared and pointed. And presently I made out two white figures on the steeple, one swinging about fifteen feet below the ball, the other standing against the shingled side without any support that I could see. Up the old tower (inside) I made my way, and two ladders beyond the "bell-deck" came upon Walter

Tygue, "Steeple Bob's" assistant, astride of a stone saddle on one of the four peaks where the tower ends and the steeple begins. There was a clear drop of a hundred feet all around him. He was "tending" the two men aloft, as witnessed a couple of ropes dangling by him. It was two jerks to come down and one to go up. Were he to lose his balance and let go the hauling-rope, the men on the swing would instantly be killed, as they had no "lock-blocks" on.

"Come out here," said Walter, "there's plenty of room," and, thus encouraged, I straddled the peak, and we sat face to face, as two men might sit on a child's rocking-horse, while the tower pigeons circled beneath us, alarmed at this intrusion. Far down on the sidewalk were little faces of distorted people; far up at the steeple-top were legs kicking at ropes. And off over red housetops was the river, and the great towers of New York spread with silver plumes by the steam jets.

"Now you can see the stirrups working," said Walter, and, looking up, I saw a figure swing back from the steeple, an arm shoot out, and a length of rope go wriggling around the shaft, cast like a lasso. Then the rope was drawn into a noose, and the noose hauled tight. The legs kicked, the figure hitched itself up about a foot, and again the rope was cast (another rope), and a second noose still higher made secure. That is all there is to it. The steeple-climber stands in a stirrup held by one noose while he lassoes the shaft above him with another noose, supporting another stirrup on which he presently stands. And so, foot by foot, the climber rises, shifting noose and stirrup at each change, resting now on one, now on the other, and finally reaching the cross, or ball, or weather-vane at the very top.

"That's Joe Lawlor chuckin' the rope," explained

Walter; "Merrill, he 's on the swing. Say, Lawlor 's a wonder at rigging. He can do anything with ropes. He 's the feller that climbs up the front of a house with suckers on his feet."

Of this fact I took note, and then inquired if I could n't get up further inside the steeple, so as to be nearer the men. Walter said I could climb ladders up to where they had punched a hole through for the rope to hold the block and falls, and I tried it. Alas! when I got there, after breathing dust and squeezing between beams, I found that I could see nothing. I was almost at the steeple-top, and could hear Merrill, through the wooden shell, humming a tune as he worked, but I was further away than before.

"Hello in there!" came a voice. "Don't monkey with that line." And it came to me that this rope, reaching down by me from yonder little hole (the one knocked through), held the block which held the swing which held the man. And an accident to this rope would mean instant death. I touched it, and drew my hand away, as one might touch some animal through the cage bars, and I felt like saying, "Good little rope!"

It was coming on to dark now, and we all went home together, over the bridge and up the avenues, talking of steeples the while. And Lawlor explained the action of his suckers in climbing walls, which is precisely that of a boy's sucker in lifting a brick. The big climbing-leathers, well soaked in oil, are pressed alternately against the stones, the right leg resting on one while the left leg presses the other against the wall a step higher. And so you walk right up the building or church or flagpole, and the smoother the surface the easier you go up. In fact, if the surface is rough you cannot use the suckers at all, as the air gets under and prevents their holding.

Then the men spoke of various jobs aloft that called up memories. Merrill told of cleaning the fifteen-foot Diana statue on the Madison Square Garden tower. "It 's hard getting over her," he said, "because she 's so blamed smooth. I guess I took three quarts of rust out of her ball-bearings. You know she 's a weather-vane, and turns with the wind." I wondered how many New-Yorkers who see the Diana every day of their lives have ever dwelt on the fact that she turns.

Talking of weather-vanes reminded my friends of a ticklish job they did on St. Paul's steeple, in New York, when Merrill, standing under the ball, held Lawlor on his giant shoulders so that Joe could lift off the weather-vane on top and ease the shaft where it had jammed. With Lawlor's weight and the weather-vane's weight, "Steeple Bob" held four hundred pounds on his shoulders during those important minutes, and, it might almost be said, stood on the dizzy edge of nothing while he did it.

Finally, Lawlor expressed the opinion that there is n't any meaner job in the business than a chimney.

"A chimney?" said I.

"That 's what. I mean one o' them big ones you see on factories. We havé to scrape 'em and paint 'em just like steeples, and that means climbing up the whole length inside. The climbing 's easy enough on bolts and braces, but it 's something fierce the air you breathe. Why, I 've gone up a two-hundred-and-forty-foot chimney with a five-foot opening at the bottom, and found the soot so thick about half-way up—so thick, sir, that I 've been almost stuck in it. Yes, sir, just had to shove my head into an eight-inch hole and bore through black stuff, beds of it. And mind, not a hole for air as big as a pin-head from bottom to top."

After bidding the men good night I reflected, with a

kind of shame, that I had drawn back from daring only once what they dare every day, what they *must* dare for their living. And I reasoned myself into a feeling that it was my duty under the circumstances to go up that steeple on the swing, as Merrill had proposed. Having begun this investigation, I must see it through; and in this mind I went to the church again the next day.

I found all hands on the "bell-deck" spreading out packets of patent gilding for the ball which awaited its new dress, all sticky from a fresh coat of sizing. Lawlor remarked that there was better gold in these little yellow squares than in a wedding-ring. "It 's twenty-four carats fine," said he, "and about as thick as a cobweb."

As to my going up on the swing there was no difficulty. Lawlor would go first, and be there to keep me in good heart, for they say it is not well for a novice to be at a steeple-top alone. Merrill would see to the lashings, and Walter would give a hand at the hauling-line. Thus all conditions favored my ascent; even the sun smiled, and after taking off coat and hat I was ready. There we were at the top of the tower, and at the base of the steeple Lawlor, red-faced and red-shirted, preparing to ascend; Merrill, pale, as he always is, but powerful, standing at the ropes; and I, in shirt-sleeves and bareheaded, watching Walter make a little harness for my kodak.

After a time Lawlor, having reached the top, called down something, and Merrill answered. It was my turn now. I climbed out through a small window and stood on the ledge, while "Steeple Bob" dropped the swing noose over my head and proceeded to lash me fast to seat and ropes.

"That 's in case a suicidal impulse should get hold

of you!" he said, smiling, but meaning it. "Now, keep this rope between your legs, and work your hands up along it as we lift you. It's anchored to St. Peter."

Then he explained how I was to press my toes against the steeple side, so as to keep my knees from barking on the shingles.

"And don't look down at all," he told me. "Just watch your ropes and take it easy. Are you ready?"

At this moment Walter said something in a low tone, and Merrill asked me to lend him my knife. I handed it out, and he stuck it in his pocket. "You don't need this now," said he, and a moment later the pulley ropes tightened and my small swing-board lifted under me. I was rising.

"Shove off there with your toes!" he cried. "Take short steps. Put your legs wider apart. Wider yet. You don't have to pull on the rope. Just slide your hands along. Now you're going!"

I saw nothing but the steeple side in front of me, and the life-line hanging down like a bell-rope between my spread legs, and the pulley block creaking by my head, and the toes of my shoes as I pressed them against the shingles step by step. It struck me as a ridiculous thing to be climbing a steeple in patent-leather shoes. I smiled to think of the odd appearance I must present from below. And then for the first time I let my eyes turn into the depths, and caught a glimpse of men on housetops watching me. I saw Merrill's upturned face down where the ropes ended. And I saw little horses wriggling along on the street.

There were three places where the steeple narrowed into slenderer lengths, and at each one was a sort of cornice to be scrambled over (and loose nails to be avoided), and then more careful steering with legs and toes to keep on one particular face of the steeple and



HOW THE STEEPLE-CLIMBER GOES UP A FLAGPOLE.

not swing off and come bumping back, a disconcerting possibility. "Hello!" called Lawlor presently, from above. "You 're doing fine. Come right along." And before I knew it the swing had stopped. I was at the top, or as near it as the tackle could take me. The remaining fifteen feet or so must be made with stirrups. And there was Lawlor standing in them up by the ball. There was not a stick of staging to support him (he had scorned the bother of hauling up boards for so simple a job), and he was working with both hands free, each leg standing on its stirrup, and several hitches of life-line holding him to the shaft top by his waist.

This steeple-lassoing exploit was one of the things I certainly would not attempt—would not and could not.

Strangely enough, as I hung here at rest I felt the danger more than coming up. It seemed most perilous to rest my weight on the swing-board, and I found myself holding my legs drawn up, with muscles tense, as if that could make me lighter. Gradually I realized the foolishness of this, and relaxed into greater comfort, but not entirely. Even veteran steeple-climbers waste much strength in needless clutching; cannot free their bodies from this instinctive fear.

I stayed up long enough to take three photographs (some minutes passed before I could unlash my kodak), and here I had further proof of subconscious fright, for I made such blunders with shutter and focus length as would put the youngest amateur to shame. Two pictures out of the three were failures, and the third but an indifferent success. There is one thing to be said in extenuation, that a steeple is never still, but always rocking and trembling. When Lawlor changed his stirrup hitches or moved from side to side the old

beams would groan under us, and the whole structure rock. "She 'd rock more," said Lawlor, "if she was better built. A good steeple always rocks."

There was n't much more to say or do up here, and presently we exchanged jerks on the line for the descent. And Lawlor cried: "Lower away! Hang on, now!" And I did over again my humble part of leg-spreading and toe-steering, with the result that presently I was down on the "bell-deck" again, receiving congratulations.

"Here 's your knife," said Merrill, after he had un-lashed me.

"What did you take it for?" I asked.

"Oh, men sometimes get a mania to cut the ropes when they go up the first time. And that is n't good for their health. I was pretty sure you 'd keep your head, but I was n't taking any chances."

After this came thanks and warm hand-grips all around, and then I left these daring men to their duties, and went down the lower ladders. I am sure I never appreciated the simple privilege of standing on a sidewalk as I did, a few minutes later, when I left the Church of the Pilgrims and came out into the pleasant autumn sunshine.

THE DEEP-SEA DIVER

I

SOME FIRST IMPRESSIONS OF MEN WHO GO
DOWN UNDER THE SEA

IN old South Street, far down on the New York river-front, is a gloomy brick building with black fire-escapes zigzagging across its face, and a life-size diver painted over its door, in red helmet and yellow goggle-eyes, to the awe and admiration of the young—to the awe and admiration of anybody who comes through this wicked-looking street by night, and smells the sea, and stares along miles of ships' noses that reach right over the car-tracks, and finally stops at the black-lettered announcement that wrecks are looked after here day or night, and mysteries of the deep penetrated by gentlemen of the diving profession in just such gigantic suits as this painted one.

None of this had I noticed, late one night (being occupied with the silent, hungry ships, and the fire-cars trailing over the dim bridge), until a brisk banjo-strumming caught my ear, and I paused at the house of wrecks, whence the sounds came. Somebody back in these moldering shadows was playing the "Turkish Patrol," and playing it remarkably well.

I followed the light down a narrow passage, and presently came upon the modern wrecker, in the person of Benjamin F. Bean, a large man smoking contentedly at a table whereon rested a telephone and phono-

graph. The phonograph was playing the "Turkish Patrol," and a single incandescent lamp, swinging overhead, illumined the scene. There were coils of rope about, and photographs of vessels in distress, and a bunk with tumbled sheets at one side, where Mr. Bean slept, often with his clothes on, while awaiting the ring of sundry danger-bells.

Divers fully expect to be objects of curiosity, for never do they work except before wondering audiences; so this one found my visit natural enough—was glad, I think, to talk a little and let the phonograph rest. It must be rather lonely, after all, watching for wrecks hour after hour, night after night, listening always for footsteps (the officer's tramp or the thug's stealthy tread), listening always to the hoot of passing vessels, listening always for bad news:

He explained to me what happens when the bad news comes, say a collision up the Hudson, a ferry-boat on fire down the bay, a line of barges sunk in the Sound, any one of a dozen ordinary disasters. In olden times such tidings must have traveled from mouth to mouth, and the wreckers of those days flashed their calls and warnings with beacon-fires. Now electricity does all this much better with the click of a key; and presently somebody, somewhere, has the office at the end of a wire telling what the trouble is, and forthwith the man in charge puts machinery in motion that will change this trouble into cash. *Br-r-r-r* calls the telephone; up spring messenger-boys in distant all-night stations, and in half an hour door-bells are ringing in Harlem or Jersey City, and the men who ought to know things know them, and whistles are sounding on big pontoons that can lift two hundred tons, and sleepy men are tumbling out of their bunks, and great chains are clanking, and tug-boats

are sputtering forth for the towing of sundry hoisting- and pumping-craft that go splashing along to the danger-spot with all appliances aboard, pneumatic, hydraulic, not to mention savory hot coffee served to the divers and the crew.

Most divers are poor story-tellers (perhaps because the marvelous grows commonplace to them from over-indulgence in it), but the stories are there in their lives, if only you can dig them out. I asked Bean if he often went down himself, and found that he was still in active service, after twenty-odd years of it, which certainly had agreed with him. He was just back from a sad errand in Pennsylvania. A boy had gone swimming in a slate-quarry, and been drowned; they had dragged for him, and fired cannon over the water, but nothing had availed, and so, finally, a diver was sent for from the city, the diver being Bean. The quarry was a great chasm four or five hundred feet deep, with eighty feet of water filling various galleries and rock shelves, in one of which the poor lad had been caught and held. The question was in which one.

"Well," said Bean, coming abruptly to the end, "I went down and got him."

That was his way of telling the story: he "went down and got him." There was nothing more to say; nothing about the two days' perilous search through every tunnel and recess of those rocky walls; nothing about the three thousand excited people who crowded around the quarry's mouth, awaiting the issue, nor the scene when that pitiful burden was hauled up from the depths.

I asked Bean if he had ever been in great danger while under the water.

"Nothing special," he said, and then added, after thinking: "Once I had my helmet twisted off."



PORTRAIT OF A DIVER. DRAWN FROM LIFE.

"What, below?"

He nodded.

"How can a diver live with his helmet off?"

"He can't, usually. 'T was just luck they got me up in time. They say my face was black as a coal." And he had no more to tell of this adventure.

With few exceptions, divers take their career in exactly this phlegmatic, matter-of-fact way. I fancy a man of vivid imagination would break under the strain of such a life. Yet often divers will go into great details about some little incident, as when Bean described the hoisting of a certain boiler sunk outside of Sandy Hook. It had been on a tug-boat of such a name, it was so many feet long and wide, and other things about the tide and the steam-derrick, and what the captain said, the point being that this boiler had acted as an enormous trap for the blackfish, of which they had found some hundreds of big ones splashing about inside, unable to escape.

So our talk ran on, and all the time I was thinking how I would like to see these things for myself. And it came to pass, as the subject kept its hold on me, that I did see them. Indeed, I spent a whole summer month—and found zest in it beyond ordinary summer pleasurings—in observing the practical operations of diving and wrecking as they go on in the waters about New York. I discovered other wrecking companies, notably one on West Street, and from the head man here learned many things. He took me out on a pier one day, where one of his crews was rescuing thirty thousand dollars' worth of copper buried under the North River. Every few minutes, with a *chunk-chunk* of the engine and a rattle of chains, the dredge would bring up a fistful of mud (an iron fist, holding a ton or so) and slap it down on the deck, where a

strong hose-stream would wash out little canvas bags of copper ore, each worth a ten-dollar bill in the market.

"This will show you," said the expert, "what a diver has to contend with at the bottom of a river. He often sinks four or five feet in the mud, just as those bags sink, and sometimes the mud suction holds him down so hard that three men pulling on the life-line can scarcely budge him. And when the mud lets go the diver comes out of it like a cork from a bottle. You can feel him flop over, clean tuckered out with kicking and working his arms. They let him lie there a minute or two to rest, and then pull him up. Why, vessels will sink ten or twelve feet in the mud, so that the diver has to take a hose down, and wash a tunnel out below the keel, to get a lifting-chain under."

"Wash a tunnel out?" I inquired.

"That 's what they do. You know how you can bore a hole in a sand-bank, don't you, with a stream of water? Well, it 's just the same with a mud-bank down below, only you need more pressure. Sometimes we use a stream of compressed air. The diver steers the hose just as a fireman steers the fire-hose, and once in a while gets knocked over by the force of it, just as a fireman does."

Tunneling mud-banks under water, with streams of water or streams of compressed air, struck me as decidedly a novelty. I was to hear of stranger things ere long.

My guide presently pointed out a splendidly built young man who was shoveling mud off the deck, not far from us.

"There," said he, "is a case that illustrates the worst of this business. That fellow is made to be a diver;

he 's intelligent, he 's not afraid, and he can stand having the suit on; he 's been down two or three times and done easy jobs of patching. If he 'd keep straight for a year or two, he could earn his ten dollars a day with the best of them. But he won't keep straight. The poor fellow drinks. We can't depend on him.



"THE DIVER'S HELMET SHOWED LIKE THE BACK OF A BIG TURTLE."

And here he is, shoveling mud for a dollar and a quarter a day, and no steady work at that."

Ten dollars a day seemed a handsome wage, and I asked if divers generally earn so much.

"Good ones do, and a diver's day is only four hours' long, or less when they go to great depths. And they draw a salary besides, and often receive handsome presents. You ought to see our chief diver, Bill Atkinson; he lives in a brownstone house." He paused

a moment, and then added: "But I guess they earn all they get."

A few days later I made Mr. Atkinson's acquaintance on board the steam-pump *Dunderberg*, then busy raising a coal-barge sunk off Fourteenth Street in the East River.

Atkinson was down doing carpenter-work on holes stove in her, and I stood on deck beside the man "tending" him, and watched the bubbles boil up from the diver's breathing, and the signals on a rubber hose and a rope. It was less air or more air, by jerks on the hose. It was rags for a leak, or a heavier hammer, or a piece of batten so-and-so long, with nails ready driven at the corners—all were indicated by pulls on the life-line or the startling appearance of hands or fingers (Atkinson's), that would now and then reach above water and move impatiently. The wreck was only five or six feet under, and the diver's helmet showed like the back of a big turtle whenever he stood up straight on the sunken deck.

Suddenly there is a scurry of barefoot youths along the pier timbers. The diver is coming up. Now he lifts himself slowly under the crushing weight, one short step at a time up the ladder. No man at all is this, but a dripping three-eyed monster of rubber and brass, infinitely fascinating to wharf loungers. The "tender" twists off the face-glass, and Atkinson says something with a snap in it, and explains what he is trying to do at the forward hatch. Then he leans over the rail on his stomach and rests. Then he goes down again.

"He 's the best-natured man I know, Bill is," remarked Captain Taylor, commander of the *Dunderberg*; "but all men get irritable under water. Why, I 've had men who would n't swear for the world up

in the air tell me they rip out cuss words something terrible down on the bottom. Just seems like they can't help it."

I noticed that the tender did not join in our talk, but stood with hands on his lines and eyes on the water, absorbed in his responsibility; he looked like an angler about to land a big fish. Neither did the men at the air-pump talk. This feeding breath to a diver is serious business.

"How long would he live, do you think," I asked, "if the pump should stop?"

"Mebbe a minute, mebbe two," said Captain Taylor. "I knew a Norwegian who was down in fifty feet of water when the hose busted. It busted on deck, where the tender heard it, and he started to lift, right away. It could n't have been over a minute before they had him up, but he was so near dead the doctors worked three hours on him before he came around. That 'll give you an idea of how far gone he was."

The captain told of other desperate chances faced by divers in his experience: of a hose and life-line fouled in a wreck; of an escape-valve frozen shut, in winter-time, by the diver's congealed breath; of a helmet smashed through by a load of pig-iron falling from its sling; of a diver dragged off a wreck by a drifting pontoon—such a record of thrilling escapes and tragedies as any wrecking-master could run over. One realized why insurance companies refuse to take risks on divers' lives, and why the diver's pay is large.

Before long Atkinson came up again, and announced that everything was ready, holes stopped and suction length in place. Two men helped undress him, while the others set the big eight-inch pipe to

pumping out the wreck, and soon it was spurting a thick stream over her side like a fire-tower.

Presently the dinner-bell rang from a tiny cabin below, and I had the honor of breaking bread with the crew of the *Dunderberg* and two of the company's stanchest divers, Atkinson and Timmans, both small, thin men with wrinkled faces, both the heroes of many adventures. Here was indeed a chance to find out things!

One of my first questions turned upon the effect of diving on a man's hearing. Was it true, as I had read, that divers often have one or both of their ear-drums ruptured by the water-pressure?

Both men thought not; most divers of their acquaintance had good hearing.

"Diving often kills a man straight out," said Timmans; "but, aside from that, I don't think it injures his health. Ain't that right, Bill?"

Atkinson nodded. He had observed that divers almost never take cold or have trouble with their lungs, although they are constantly exposed to all weathers, and often live and sleep in wet clothes for days and nights. As a young man, he himself had been a book-keeper, in delicate health. People thought he had consumption. So he gave up bookkeeping and, by accident, became a diver. He had never had a sick day since, and he had worn the suit now for twenty-nine years.

"About a man's ears," said he; "there 's no doubt you get a pressure in 'em when you go down, and the pressure gets harder and harder the deeper you go, that is, until your ears crack."

"Crack?" said I.

"Well, that 's what we call it, but I don't suppose anything really cracks. After you get down, say,

thirty feet, your ears hurt a good deal, especially if by chance you have a little cold; and you keep opening your mouth and swallering to make the crack come, and the first thing you know, you hear a sound inside your head like striking a match; that 's the crack, and then you can go on down as far as you please, and you won't feel any more pain in your ears until you 're coming up again; then you get a reverse crack. They say it 's the air working in and out of your head. I don't know what it is, but I know some men's ears won't crack, and those men can't never make divers."

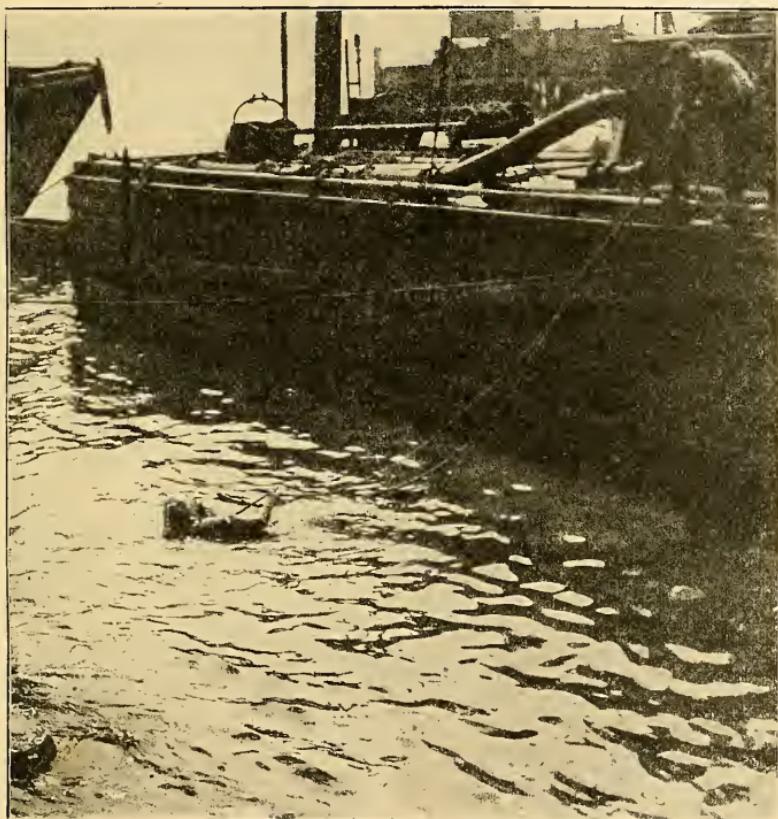
"How deep can a diver go down?" I inquired.

The company smiled at this, and turned to Atkinson, who smiled back, and then referred modestly to one of the deepest dives on record, one hundred and fifty feet, made by himself some years before up the Hudson. He had a pressure of six atmospheres on him at that depth, and could stay down only twenty minutes. "I 'll tell you about that some other day," said he. "It 's pretty near time now for me to be sweeping up this coal."

Then, answering my look of surprise at the word "sweeping," he explained how they lessen the weight of a sunken barge by first pumping out the water in her, and then pumping out the coal. The same suction-pipe does both, and will discharge thirty-five or forty tons of coal an hour, on a chute which holds the coal while the water streams through. During this operation the diver is down in the barge, moving the suction-end back and forth, up and down—the "sweeping" in question—until no more coal is left for its hungry mouth.

"We pump grain out of wrecks in the same way," said Atkinson, "tons and tons of it! and they dry it in ovens and sell it. A man must look sharp, though,

and not get himself caught. We had a diver—he was new at the business—who got his knee against the suction-pipe one day while he was pumping coal, and



DIVER STANDING ON SUNKEN COAL BARGE.

it held him as if he was nailed there. He was so scared he tore himself loose; but he had to rip a piece out of his suit to do it. He stayed down, though, just the same."

"What!—with a hole in his suit?"

"That does n't matter, as long as it 's only in the leg. You see, the air in the helmet presses down hard enough to keep the water below a man's neck. But he must n't bend over so as to let his helmet get lower than the hole."

"I should say not!" put in Timmans.

"Why, what would happen if he did?"

"He 'd be killed quicker than you can wink. The air from the helmet would rush out at the hole, and he 'd be crushed by the weight of the water."

I don't know whether Mr. Atkinson realized the full truth of his words, but I found, on consulting the authorities, that a diver's body at thirty-two feet is subjected to a pressure of water amounting to forty tons, at sixty-four feet to eighty tons, at ninety-six feet to one hundred and twenty tons, etc. And it is only the great counter-pressure in the helmet of air from the air-pump that enables the diver to endure this otherwise deadly weight. It follows that the deeper a diver goes, the harder work it is for the air-pump men to drive air down to him; and at great depths as many as four men are sometimes needed at the pump to conquer the water resistance and keep open the escape-valve (for air breathed out) at the helmet-top.

Here ended this day's talk, for the coal would wait no longer; Atkinson must go down again to his "sweeping." But there were other days for me aboard the *Dunderberg*—other glimpses into these brave, simple lives. Think what these fellows do! Here is a huge, helpless vessel at the bottom of a bay, with the tide tearing her to pieces, and down into the depths comes a queer little man, as big as one of her anchor-points, and stands beside her in the mud, and feels her over, and decides how he will save her; and then does it—

does it all alone. And what he does is never the same as anything he has done before; for each wreck is a new problem, each job of submarine patching has its own difficulties and dangers. Oh, bored folk, idle folk, go to the wreckers, say I, if you want a new sensation; watch the big pontoons put forth their strength, watch the divers, and (if you can) set the crew of the *Dunderberg* to telling stories.

II

A VISIT TO THE BURYING-GROUND OF WRECKS

LITTLE by little, one picks up lore of the divers—small things, yet edifying. In summer a diver wears underneath his suit, to keep him cool, the same flannel shirt and thick woolen socks that he wears in winter to keep him warm. But he wears mittens in winter on his hands, which are bare in summer. On the bitterest day in January he finds comparative warmth in deep water, as he finds a chill there in torrid August. Summer and winter he perspires very freely, and a little work brings him to the limit of his strength, the strain being chiefly on the lungs. The deeper he goes the more exhausting becomes every effort.

A diver often endures real suffering (like the foot-tickling torture) because he cannot scratch his nose or face, and they tell of one man who worked in great distress because, when he got down, he found a June-bug in his helmet, and had to bear the insect's lively promenading over his features, powerless to stop it. And there was a diver who, in bravado, used to smoke a cigarette inside his helmet.

Divers, as a class, are not superstitious. Seldom do their thoughts down below stray into realms of fantasy, nor have they time to dream, but only to hammer, and saw, and ply the crowbar, and drive iron spikes twenty inches long into huge timbers—in short, to attend strictly to their work.

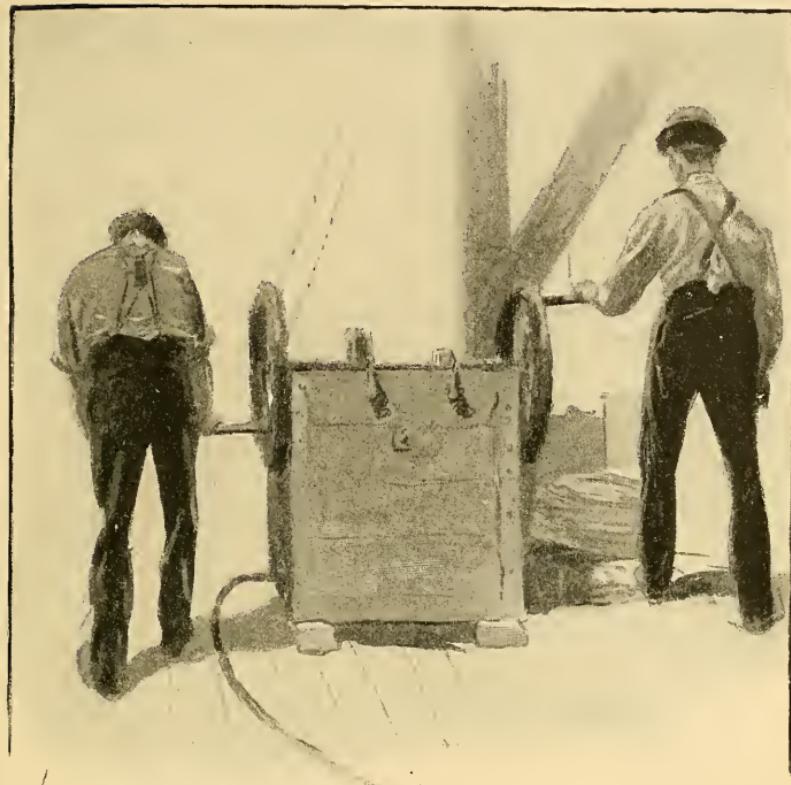
It is amusing to note the scorn of practical divers for the nice electric-lighting and telephone contrivances of divers who never dive, but sell their inventions to the Government for its Newport diving school, which same inventions remain, for the most part, in their spick-span boxes. It seems simple enough to have submarine lights; yet divers who dive prefer to grope in the almost darkness of our ordinary waters. It seems a distinct advantage that diver and tender be able to talk over a wire; yet divers who dive keep jealously to the clumsy system of jerks on the lines, and will not even be bothered with the Morse alphabet. The fact is, a diver has quite as much as he can attend to with the burden of his suit (about a hundred and seventy-five pounds), and his two lines to watch and keep from kinks and entanglements. Touch one of these lines, and you touch his life. Fasten a new line to him, or two new lines, and you enormously increase his peril. Imagine yourself stumbling about in a dark forest, with a man strapped on your back, and several ropes dragging behind you among trees and rocks, each separate rope being to you as breath and blood! That is precisely the diver's case. So he goes; so he works. And when they offer him pretty apparatus to increase his load, he will have none of it. Nor will he tug any extra ropes. "I have ways enough of dying as it is," says he.

Working thus in gloom or darkness, the diver develops his senses of feeling and locality. He gains certain qualities of blind men, and finds guidance in unlooked-for ways. The ascending bubbles from his helmet, for instance, shine silver white and may be seen for a couple of fathoms. These bubbles have a trick of lodging in a vessel's seams, and so give the

diver a rough pattern of her. Again, in searching for leaks, the sense of hearing helps him, for he can distinguish (after long habit) the sucking sound of water rushing through the holes.

One is sorry to learn that divers go to pieces early; few of them last beyond fifty. As they grow old their keenness wanes; they lose their bearings easily down below, and show bad judgment. And fear of the business grows upon them. Often they seek false courage in strong drink, which hurries on the end. Too many of them, after searching all their lives for wrecks, wind up as wrecks themselves. But it is good to know that there are exceptions—divers like Bill Atkinson, sturdy and true at fifty, and good in the suit for years to come, unless their wives persuade them to retire. The diver's wife, I am told—poor woman!—starts with terror every time she hears a door-bell ring.

I must speak now of the burying-ground for wrecks, one of the strangest, saddest, most interesting burying-grounds I can think of. It was a disaster to the tug-boat *America* that brought me there, this ill-fated craft having been cut half through in the North River and sunk by a great liner she was helping into dock. The *America* went down forthwith in sixty feet of water—sank so suddenly that all aboard her had to cast themselves into the water and fight for it. The fireman and the cook, not knowing how to swim, fought in vain, and ended their lives there. It is astonishing how many men who follow the sea as a business cannot swim. Well, in due course the wreckers came up to lift the tug-boat, and Atkinson (who cannot swim either) directed the job. They swung chains under her, fore and aft, they “jacked her up” nearly to the surface, and then, while four pontoons held her,



THE MEN AT WORK WITH THE AIR-PUMP.

the *Pinafore*, the *Catamaran*, and two others (only the working crews know the names of these pontoons), they all splashed slowly up the river under tow of the wrecking-tug *Fly*, and finally came to the burying-ground of wrecks. Here they "jacked her up" some more (it was "We 've got her!" "Slack away now!" and "R'heh-eh-eh!" as the men strained at the blocks), and then they grounded her on the mud, where wrecks have been grounded for years, and left her, with all the others, to rust and ruin and rot.

But before they grounded her there was a long time

to wait for high tide—time for a good meal on the *Catamaran*, and a talk about hazards of the sea as divers know them. It was then that Atkinson told me the promised story of his deepest dive. I wish all men who do big things would speak of them as simply as he did.

“It’s like this,” said he: “in diving, the same as in other things, every man has his limit; but he can’t tell what it is until the trial comes. At this time I’m talking about (some ten years ago) I thought a hundred feet about as deep as I wanted to go. If there are two hundred divers in the country, you can bet on it not ten of them can go down over a hundred feet. Well, along comes this job in the middle of winter—a head-on collision up the Hudson off Fort Montgomery, and a fine tug-boat gone to the bottom. We came up with pontoons to raise her, and Captain Timmans (he’s the father of Timmans the diver) ordered Hansen down to fix a chain under her shaft—there’s the man now.”

A big Scandinavian in the listening circle looked pleased at this mention. He was Hansen.

“We knew by the sounding that she lay in a hundred and fifty feet of water on a shelf of bottom over a deeper place, and Hansen was a little anxious. He got me to tend him, and I remember he asked me, when I was putting the suit on him, if I thought he could do it. Remember that, Hansen?”

Hansen nodded.

“I told him I thought I could do the job myself, so why should n’t he? but that was partly to encourage him.

“Anyhow, Hansen went down, and I got a signal ‘All right’ from him when he struck the bottom. Then

the line kept very still, and pretty soon I jerked it again. No answer. So I knew something was wrong, and began to haul him up quick, telling the boys to turn faster. He was unconscious when we got him on deck, but he soon came round, and said he felt like he 'd been dreaming. He 'll tell you if that ain't right."

"It 's right," said Hansen.

"We could n't work any more that day, on account of the tide, but Captain Timmans said the thing had to be done the next morning, and wanted Hansen to try it again; but Hansen would n't."

"Was n't no use of trying again," put in Hansen.

"That 's it; he 'd passed his limit. But it seems I had a longer one. Anyhow, when the captain called on me, I got into the suit and went down, and I stayed down until that chain was under the shaft. It took me twenty minutes, and I don't believe I could have stood it much longer. The pressure was terrible, and those twenty minutes took more out of me than four hours would, say, at fifty feet. But we got the tug-boat up, and she 's running yet."

After this Hansen told a story showing what power the suction-pipes exert in pumping out a vessel. He was working on a wreck off City Island, at the entrance to the Sound. He had signaled for rags to stuff up a long crack, and the tender had tied a bundle of them to the life-line, and lowered it to him by slackening out the line. All this time the pump was working at full pressure, throwing out streams from the wreck through four big pipes. Suddenly the life-line came near the crack, and was instantly drawn into it and jammed fast, so that Hansen would have been held prisoner by the very rope intended to save him, had it not been for the slack paid out, which was for-



"I STAYED DOWN UNTIL THAT CHAIN WAS
UNDER THE SHAFT."

tunately long enough to bring him up. Had it been his hand or foot that was seized in that sucking clutch, the incident would have had a sadder ending.

Then came other stories, until the day was fading and the tide was right, and Atkinson was ready for the grounding of this soaked and battered tug-boat. Presently he calls "Look out for that rope. Get yer jacks ready. Now slack away!" And forthwith pulleys are creaking and great chains are grinding down link by link as the men pump at the little "jacks" and the forty-foot timbers that stretch across pontoons and hold the wreck-chains groan on their blocks, and at last the *America* comes to rest safely,

ingloriously on the mud. Poor *America*! so proud and saucily tooting only the other day, now a bedraggled wreck on these Weehawken flats, destined to what fate who knows? To be lifted from the mud, patched up, rebuilt, quarreled over by owners and insurance people, or perhaps simply left here, with the others, for wharf-rats to swarm in and boys to go crabbing on!

The burying-ground of wrecks! What a sight from the rugged height back of the water! Here are blackened, shapeless hulks from the great river fire of 1900, when red-hot liners drifted blazing to these very flats. Here is the ferry-boat *River Bell*, decked with flags in her day, and danced on by gay excursionists, now thick with mud and slime, her deck-beams spongy under foot, her wheel-frames twisted like a broken spider's-web. Here are the half-sunken halves of some ice-barge, cut clean in two by a liner. Here, heaving with the tide, is an aged car-float with a watchman's shanty on it, heaped with its rusted boilers, its anchors, cranes, gear-wheels, cables, pumps, a tangle of iron things that were once important. Here is a scuttled tug-boat that has been in a law-suit (and the mud) for years. Here is a coal-barge, wedged open and sunk by her owner to steal the insurance money. Wrecks spread all about us, and above them rise the masts and cranes of pontoons and pumping-craft, that seem, in the shadows and desolation, like things of evil omen guarding their prey.

Night is coming on. Lights show in the great city across the river. Ferry-boats pass. Lines of barges pass. Whistles sound. The waves splash, splash against the wrecks, touching them gently, one would say. But nobody else cares. Nobody comes near.

Nobody looks. The divers go home. The wrecking-crews eat and turn in to sleep. A rat squeals somewhere. These helpless, crippled hulks are alone in the night, and they grind, grind against decaying stumps. They are wrecks, they are dead, they are buried—and yet they can move a little in the mud!

III

AN AFTERNOON OF STORY-TELLING ON THE STEAM-PUMP "DUNDERBERG"

WHEN there is difficult diving to be done in the East River, or in any river where the tide runs strong, you will see the wrecking-boats swing idly at anchor for hours waiting for slack water, the only time when divers dare go down. And often there is half a day's waiting for half an hour's work, and often a week goes by on a two hours' job, say, in full mid-stream, where not even the most venturesome beginner will stay down more than twenty minutes at the turn, lest he be swept away, ponderous suit and all, by the rush of the river. It 's start your patch and leave it to be ripped open by the beating sea; it 's get your chain fast nine weary times, and have it nine times torn away over night by some foolish, bumping tug-boat; in fact, it 's worry and aggravation until the thing is over.

Also, this is the time of times, if you can get aboard, to make acquaintance with the wreckers, to pick up lore of the diving-suit and tales of the divers.

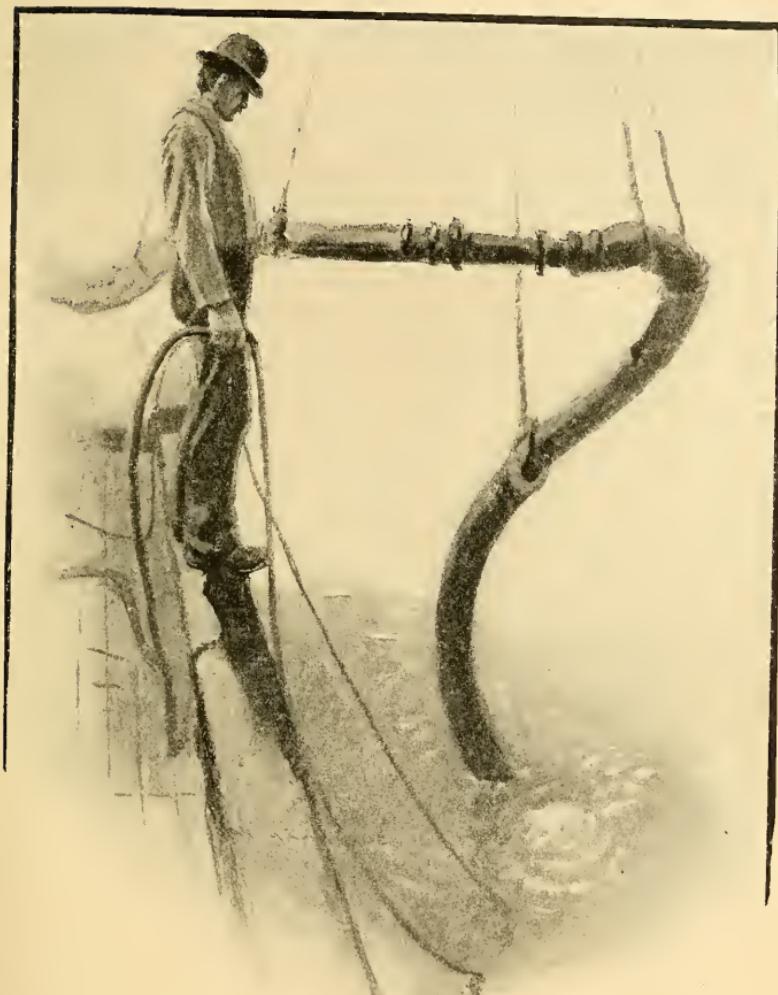
It was bad weather when we, on the sturdy old *Dunderberg*, were busy at a wreck off the Brooklyn shore, not far from Grand Street ferry (I had as much to do with lifting this wreck as the pewter spoons stuck around the little cabin). It was n't much of a wreck anyhow—only a grain-boat—but it had my gratitude for stubbornly refusing to come up.

And so we had hours to spend down in the cabin aforesaid, which could barely hold cook-stove and dining-table, but managed to be parlor and bedroom besides; also laundry on occasions. The *Dunderberg*, I should explain, was originally a mud-scow, but for good conduct and an injury to her nose had been changed into a steam-pump. She could suck her forty tons of coal an hour out of a wreck with the best of them. And she traveled with four pontoons, no one of which could touch her in table fare, especially coffee.

Late one afternoon, when the rain was drizzling and the swinging brass lamps lit, we sat about on wooden stools (and some were curled up in bunks along the walls) and listened to the talk of Atkinson and Timmans and Hansen, who had seen and done strange things in their time.

They were discussing the escape-valve in a diver's helmet, and arguing whether it pays to stiffen the spring for very deep diving. Atkinson, who had worked eight fathoms deeper than either of them, said he left his spring alone; he used the same suit and the same valve action for any depth.

"But I look out for sand-banks," said he, "ever since that fellow—you know who I mean—had one cave in on him in the North River. He was tunneling under a vessel with a wall of sand beside him higher than his head, and the first thing he knew he was flat on his back, with sand jammed in his valve so it could n't open. It was n't a minute before he was shot up to the surface like a balloon. The reason of that," he explained for my benefit, "is because a diving-suit with its valve shut gets lighter and lighter as they drive down air from the air-pump, until all of a sudden it comes up, man and all, just as a plank would if you held it on the bottom and then let it go."



THE MAN WHO ATTENDS TO THE DIVER'S SIGNALS.

"Talking about planks coming up," said Timmans, who was seated under the picture of a prize-fighter, "I was down on the North German Lloyd steamer

Main, the one that was burned and sunk, fixing a suction-pipe to pump grain out of her, when a big wooden hatch got loose and came up under me. I was working between decks, and the hatch swung me right up against the overhead beams and held me there, squeezing the life-line and hose so tight I could n't signal. It 's lucky the hose was wire wound, or that would have been the last of me. But I got my air all right, and after a while I worked free."

"Wire wound and all," observed Atkinson, "I 've had my hose squeezed so the air was shut off. I was on a wreck off one of the Hoboken docks once, when an eight-inch suction-pipe caught the hose coming down through a hatch, and the next second I felt my air stop, though I could hear the pump beating. I jerked 'slack away' on the life-line, and that loosed the hose and saved me, but I got a blast of compressed air as the jam eased that jumped me up a yard."

"Suppose your life-line had been jammed, too," I asked, "so that you could n't jerk 'slack away'?"

Atkinson paused to think. "There 's a difference of opinion about how long a man can live on the air that 's in his helmet. Some say three or four minutes. I don't believe it. I think two minutes would do the business."

"There was George Seaman—" began Timmans.

"Yes," said Atkinson, taking up the story, as was a senior's right, "there was George Seaman, who put trust in the argument of Tom Scott and Low and some of those old-timers, that a man can cut his hose and press his thumb quick against the hole and live long enough on what air 's in the helmet to reach the top. Years ago they used to give that talk to us youngsters, but I notice none of 'em ever tried it. Well, Seaman, he *did* try it; he was down on a wreck somewhere

along Sixtieth Street, and his hose got caught in the timbers. The life-line was all right, and he was getting air enough, only when they tried to haul him up he stuck on account of the hose. They tried three times to lift him, and each time he 'd come up a few feet and stick, and then they 'd have to let him fall back. You can see that 's awful discouraging for a man, especially when he 's tired and cold. If Seaman had kept his nerve and waited they 'd prob'bly have sent another diver down to get him untangled, but he did n't keep his nerve. All he saw was that the hose was caught and he could n't free it, and they could n't get him up. It 's a lot easier to get rattled at the bottom of a river than up in the air, and Seaman called to mind what he 'd heard about stopping the hole with your thumb, and he got out his knife. All divers carry a knife fast to the suit. See, like this." He drew a two-edged knife, a wicked-looking weapon, out of its leatheren sheath, and moved his thumb along the edge.

"Then Seaman he felt for the hose, and made ready to cut. His idea was, you see, to slash the hose at one stroke, then jerk on the life-line to be hauled up quick, and keep the hole shut with his thumb while he came up. I can picture him now with his knife on the hose, sort of praying a minute, like a man might with a knife at his throat. That 's what it amounted to. Well, he wrote the story of what he did right there on the hose, and wrote it plain. They 've got the piece at the office, and they 'll show it to you if you ask 'em. Seaman made his cut with about two men's strength; I 'll bet not one of you boys could do near as well as he did at cutting a hose through with one stroke. His slash came clear through all but a shaving of rubber, and he tried to cut that with a second stroke; but the

knife struck a new place about an inch away, and he slashed her half through there. Then he tried nine times more, and made nine separate cuts at the hose; and there they are to-day, about half an inch apart, each one a little shallower than the one before, and the last two or three only scratches on the outside. That was just as he died, and you can figure out how long it prob'ly took him to make those eleven knife strokes. I suppose there ought to be thirteen, but eleven 's what there is. You 'll count 'em."

Not only did I count them, these eleven tragic cuts, but I have the piece of hose to this day. The office people gave it to me, and never do I look but with a shiver at this dumb record in diminuendo of agony and sacrifice.

"I suppose that settled the question of stopping a hose with your thumb?" I remarked.

"That 's what it did!" said Atkinson.

After this there were more stories. I can't begin to say how many more. Every time a diver goes down, one would say, something new happens to him, something worth telling about. Hansen related an experience of his with a conger eel. Atkinson told how a Dock Department diver named Fairchild was blown to death under forty feet of water when twenty-eight pounds of dynamite he was putting in for blasting went off too soon. Timmans told how he fainted away once, one hundred and five feet down, and another time let the water into his suit by pulling out a helmet lug on a foolish wager. And that reminded Atkinson of the time his gasket (the rubber joint under the collar) was cut through by the slam of an iron ladder, and the air went out "Hooo," and a quick jerk on the life-line was all that saved him. Last of all they told the story of old Captain Conkling and the Hol-

yoke Dam, a story known to every diver. It seems there was a leak in this dam, and the water was rushing through with so strong a suction that it seemed certain death for a diver to go near enough to stop the leak. Yet it was extremely important that the leak be stopped—in fact, the saving of the dam depended on it. So Captain Conkling, who was in charge of the job, induced one of his divers to go down, and reluctantly the man put on his suit, but insisted on having an extra rope, and a very strong one, tied around his waist.

“What’s that for?” asked Conkling.

“That’s to help get my body out, if the life-line breaks,” said the diver.

“Go on and do your work,” replied Conkling, who had little use for sentiment.

It happened exactly as the diver feared. He was drawn into the suction of the hole, and when they tried to pull him up both hose and life-line parted, and the man was drowned, but they managed to rescue his body with the heavy line, just as he had planned.

Then Conkling called for another diver, but not a man responded. They said they were n’t that kind of fools.

“All right,” said the captain, in his businesslike way; “then I’ll go down myself and stop that hole.” And he called the men to dress him.

At this time Captain Conkling was seventy-five years old, and had retired long since from active diving. But he was as strong as a horse still, and no man had ever questioned his courage.

In vain they tried to dissuade him. “I’ll stop that hole,” said he, “and I don’t want any extra rope, either.”

He kept his word. He went down, and he stopped the hole, but it was with his dead body, and to-day somewhere in the Holyoke Dam lie the bones of brave old Captain Conkling, incased in full diving-dress, helmet and hose and life-line, buried in that mass of masonry. No man ever dared go down after his body.

IV

WHEREIN WE MEET SHARKS, ALLIGATORS, AND A VERY TOUGH PROBLEM IN WRECKING

TIMMANS, whom I used to call the strident diver, because of his keen observation and capacity for wonder, leaned against the step-ladder that reached down from hatch to cabin on the *Dunderberg*, and remarked, while the others listened: "I did a queer job of diving once down into the hold of a steamship, a National liner, that lay in her dock, blazing with electric lights, and dry as a bone. Just the same, I needed my suit when I got down into her—in fact, I would n't have lasted there very long without air from the pump.

"Some queer cargo?" suggested Atkinson.

"That 's it. She was loaded with caustic soda, or whatever they make bleaching-powder of—barrels and barrels of it, with the heads broke in after a storm, and it was n't good stuff to breathe, I can tell you. First they set men shoveling it out, with sponges in their mouths, against the dust and gases, but one man coughed so hard he tore something in his lungs or head and died. Then they sent for a diver—that was me—and I worked hours down there hoisting and shoveling, like I was at the bottom of the bay, only there was no water to carry the weight. Say, but was n't that suit heavy, and when I looked out through my helmet-glasses it seemed as if I was digging through

a snow-field, with such a terrible dazzle it made my eyes ache to look at it."

"I suppose you don't usually see much under water?" said I.

"Depends on what water it is," answered Timmans.

"All rivers around New York are black as ink twenty feet down," remarked Atkinson.

"I know they are," said Timmans, "but I 've seen different rivers. When I was diving off the Kennebec's mouth, five miles southeast of the Seguin light (we were getting up the wreck of the *Mary Lee*), then, gentlemen, I looked through as beautiful clear water as you could find in a drug-store filter. Why, it reminded me of the West Indies. I could see plainly for, well, certainly seventy-five feet over swaying kelp-weed, eight feet high, with blood-red leaves as big as a barrel, all dotted over with black spots. There were acres and acres of it, swarming with rock-crabs and lobsters and all kinds of fish."

"Any sharks?" said I.

Hansen and Atkinson smiled, for this is a question always put to divers, who usually have to admit that they never even saw a shark. Not so Timmans.

"I had an experience with a shark," he answered gravely, "but it was n't up in Maine. It was while we were trying to save a three-thousand-ton steamer of the Hamburg-American Packet Company, wrecked on a bar in the Magdalena River, United States of Colombia. I 'd been working for days patching her keel, hung on a swinging shelf we 'd lowered along her side, and every time I went down I saw swarms of red snappers and butterfish under my shelf, darting after the refuse I 'd scrape off her plates; and there were big jewfish, too, and I used to harpoon 'em for the men to eat. In fact, I about kept our crew sup-

plied with fresh fish that way. Well, on one particular day I noticed a sudden shadow against the light, and there was a shark sure enough; not such an enormous one, but twelve feet long anyhow—big enough to make me uneasy. He swam slowly around me, and then kept perfectly still, looking straight at me with his little wicked eyes. I did n't know what minute he might make a rush, so I caught up a hammer I was working with—it was my only weapon—and struck it against the steamer's iron side as hard as I could. You know a blow like that sounds louder under water than it does in the air, and it frightened the shark so he went off like a flash."

"Perhaps he was n't hungry," laughed one of the crew.

"Not hungry? I 'll tell you how hungry those sharks were. They 'd swallow big chunks of pork, sir, nailed and wired to barrel heads, as fast as we could chuck 'em overboard; swallow nails, wire, barrel heads, and all, and then we 'd haul 'em in by ropes, that did for fish-lines, only it took twenty or thirty men to do the hauling. And there were plenty of sharks 'round, only they never seemed to tackle a man in the suit."

"Some say it 's the fire-light of the valve bubbles that scares sharks off," commented Atkinson. "I don't know what it is, but I know the bubbles shine something wonderful as you watch 'em boiling up out of your helmet."

"Phosphorescence," I suggested, and then went back into the talk for some broken threads.

"How about that steamer you were telling about," I asked; "the one that was wrecked on the bar? Did you save her?"

"I should say we did," replied Timmans, "and I

guess the company wished we had n't; it cost them more money than the job was worth. Why, if I should start telling how we saved that steamer I don't know when I 'd get through. It took us eight solid months. Yes, sir, and that meant sixty men to feed and pay wages to—forty in the wrecking-crew and twenty on the tug. Oh, but we did have trouble—trouble all the time, but we had fun, too, especially when some o' these gay Bowery lads we 'd picked up.got loose on the mainland. Talk about scraps!"

Timmans paused as if for invitations to spin the whole yarn, and these he immediately received.

"Tell about painting the alligator," urged Hansen.

"Oh, that was a bit of foolishness me an' another fellow done. He was a Dutchman, and got me to help him catch an alligator one day. He said he could bring him up North and get a big price for him. Well, we noosed one after a whole lot of chasing in a lagoon, and kept him four or five weeks, but he would n't eat, and the boys all gave us the laugh. So the Dutchman got up a scheme to paint him white and put him back in the lagoon. His idea was that this white alligator would scare out all the other alligators, and then we 'd capture mebbe twenty or thirty on the banks, and make our fortune."

He paused a moment with a twinkling eye, and Hansen snickered.

"Well, we done it. We painted that alligator white, and put him back in the lagoon, and you can shoot me if those other alligators did n't eat him. Yes, sir; they chewed him clean up before we 'd hardly got the ropes off him."

"What did the Dutchman say?" asked Hansen, shaking with mirth.

"He stuck to it his idea was all right, but it was the

blamed alligator's fault for being too weak with fasting to fight the ones as were n't painted, and he wanted somebody to help him catch another, but nobody would."



A DIVER AT WORK ON A STEAMBOAT'S PROPELLER.

Then Timmans came back to the saving of the wreck, and it really was an amazing story of patience and ingenuity against endless obstacles. I doubt if men from anywhere but America would have carried such a hopeless undertaking through to success. First they rigged up a wire railway from wreck to shore, and slid off a valuable cargo of alpaca, silks, and beer

bit by bit along the wire to land (where they conscientiously drank the beer). Then they hitched a hawser to the steamer, and by clever engineering managed to drag her off the bar against the river current; but presently this current, sweeping down from the mountains, grew too swift for the wrecking-tug, and she in turn was dragged down stream against all the strength of her engines, and saw herself threatened with destruction on the bar. Then the captain of the tug, in his peril, ordered the hawser cut; and thirty-nine men of the wrecking-crew were left to their fate on the abandoned wreck. Their adventures alone would make a thrilling chapter, but they were rescued finally from the half-sinking steamer, after she had somehow crossed the bar and wrecked herself anew in the breakers some miles down the coast.

Then weeks passed while the wrecking-crew worked at patching the steamer's holes so that she would float, and every day Timmans went down in his suit and did blacksmith work and carpenter work on her torn plates and beams, in constant danger of being crushed in the deep sand trough she rocked and slid in. Sometimes the whole iron hull, beaten against by the ocean, would go grinding along, breaking down a wall of sand ten feet high, almost as fast as Timmans could walk. And to be caught between her side and that wall would have ended his days forthwith. Diving-suit and man would have been crushed like an egg-shell.

Finally, when she was ready they made fast a sixteen-inch hawser, and put on full steam to pull her off into deep water. Off she came, and all was going well with the towing when a fierce tropical storm came upon them, and the steamer turned broadside to its

fury, and the great hawser snapped like a kite-string, and back she went on a coral-reef.

Once more they began at the beginning, and in time had another hawser ready, and tried again. This time the hawser parted by grinding on the beach as they dragged her.

Then, after long delay, they got a sixteen-inch hawser, wound with wire, that would resist the friction of rocks and sand, and all would have happened as they hoped had not a sawfish, sent by the evil power that thwarted them, thrust its jagged weapon through the hawser strands, piercing the wire and severing the big tow-line. The wrecking company still shows the saw of that mischievous fish among its curiosities.

So Timmans's narrative ran on endlessly, with details of how they stopped some fresh leaks with sixty-five barrels of cement, and how they quelled a mutiny and how they finally got the steamer off, and rigged up a patent rudder that steered her over twenty-five hundred miles, until they landed her home, two hundred and fifty-odd days after the expedition started. All going to show the kind of stuff American wreckers are made of.

V

IN WHICH THE AUTHOR PUTS ON A DIVING-SUIT AND GOES DOWN TO A WRECK

ONE day I asked Atkinson, as master diver of the wrecking company, if he would let me go down in his diving-suit; and he said yes very promptly, with an odd little smile, and immediately began telling of people who, on various occasions, had teased to go down, and then had backed out at the critical moment, sometimes at the very last, just as the face-glass was being screwed on. It was a bit disconcerting to me, for Atkinson seemed to imply that I, of course, would be different from such people, and go down like a veteran, whereas I was as yet only *thinking* of going down!

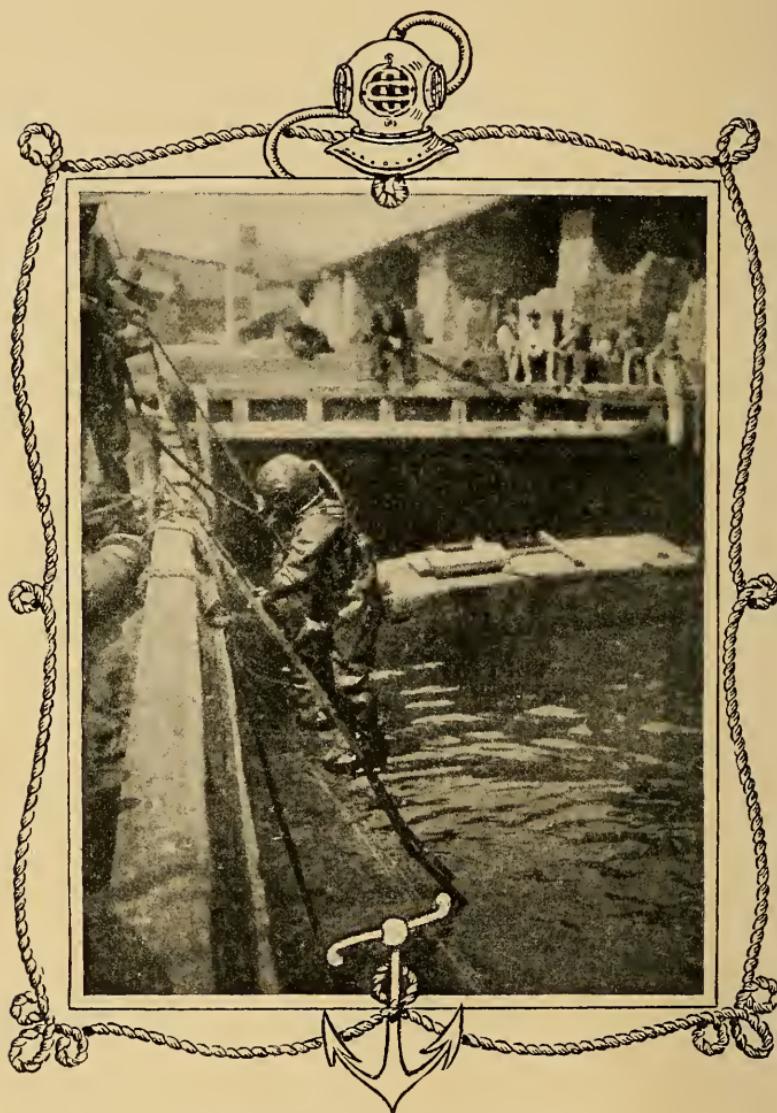
"There 's a wreck on the Hackensack," said he; "it 's a coal-barge sunk in twenty feet of water. We 'll be pumping her out to-morrow. Come down about noon, and I 'll put the suit on you."

Then he told me how to find the place, and spoke as if the thing were settled.

I thought it over that evening, and decided not to go down. It was not worth while to take such a risk; it was a foolish idea. Then I changed my mind: I would go down. I must not miss such a chance; it would give me a better understanding of this strange business; and there was no particular danger in it, only a little discomfort. Then I wavered again, and

thought of accidents to divers, and tragedies of diving. What if something went wrong! What if the hose burst or the air-valve stuck! Or suppose I should injure my hearing, in spite of Atkinson's assurance? I looked up a book on diving, and found that certain persons are warned not to try it—full-blooded men, very pale men, men who suffer much from headache, men subject to rheumatism, men with poor hearts or lungs, and others. The list seemed to include everybody, and certainly included me on at least two counts. Nevertheless I kept to my purpose; I would go down.

It was rising tide the next afternoon, an hour before slack water (slack water is the diver's harvest-time), when the crew of the steam-pump *Dunderberg* gathered on deck to witness my descent and assist in dressing me; for no diver can dress himself. The putting on a diving-suit is like squeezing into an enormous pair of rubber boots reaching up to the chin, and provided with sleeves that clutch the wrists tightly with clinging bands, to keep out the water. Thus incased, you feel as helpless and oppressed as a tightly stuffed sawdust doll, and you stand anxiously while the men put the gasket (a rubber joint) over your shoulders and make it fast with thumb-screws, under a heavy copper collar. Next you step into a pair of thirty-pound iron shoes that are strapped over your rubber feet. And now they lead you to an iron ladder that reaches down from rail to water. You lift your feet somehow over the side, right foot, left foot, and feel around for the ladder-rungs. Then you bend forward on the deck, face down, as a man would lay his neck on the block. This is to let the helpers make fast around your waist the belt that is to sink you presently with its hundred pounds of lead. Under this



THE AUTHOR GOING DOWN IN A DIVER'S SUIT.

belt you feel the life-line noose hugging below your arms, a stout rope trailing along the deck, that will follow you to the bottom, and haul you back again

safely, let us hope. Beside it trails the precious black hose that brings you air.

Now Atkinson himself lifts the copper helmet with its three goggle-eyes, and prepares to screw it on. The men watch your face sharply; they have seen novices weaken here.

“Want to leave any address?” says Captain Taylor, cheerfully.

I admit, in my own case, that at this moment I felt a very real emotion. I watched two lads at the air-pump wheels as if they were executioners, though both had kind faces, and one was sucking placidly at a clay pipe. I thought how good it was to stay in the sunshine, and not go down under a muddy river in a diving-suit.

“Wait a minute,” I cried out, and went over the signals again—three slow jerks on the life-line to come up, and so on.

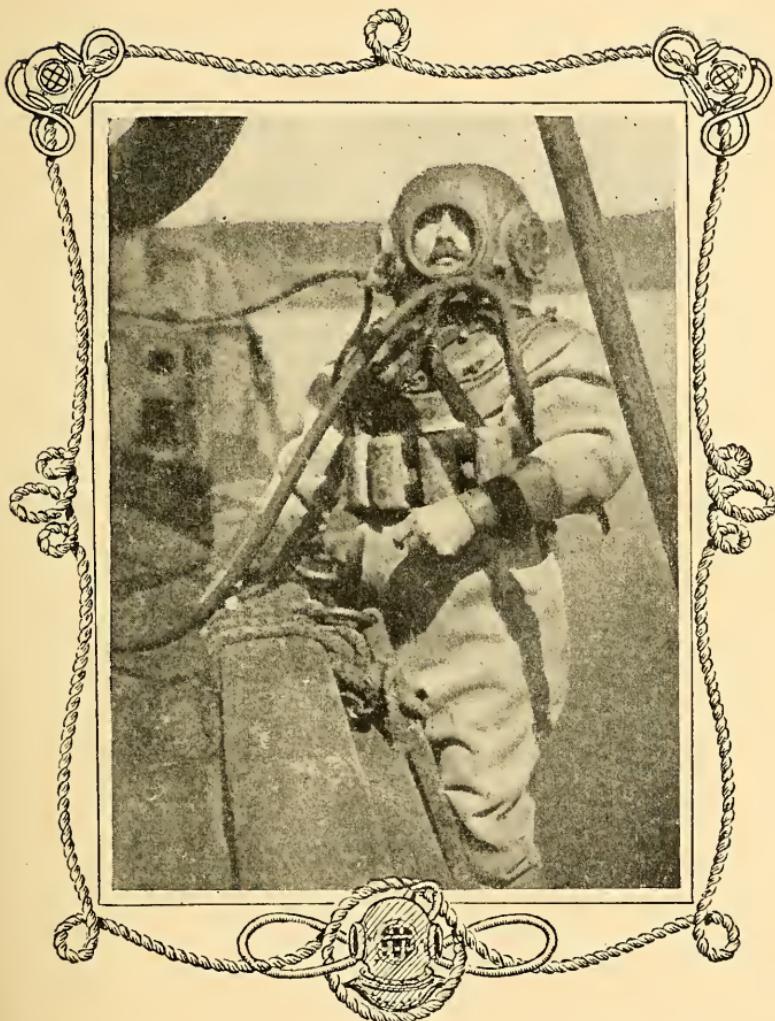
Now the helmet settles down over my head and jars against the collar. I see a man’s hands through the round glasses crisscrossed over with protecting wires; he is screwing the helmet down tight. Now he holds the face-glass before my last little open window. “Go ahead wid de pump,” calls a queer voice, and forth-with a sweetish, warmish breath enters the helmet, and I hear the wheeze and groan of the cylinders.

“If you get too much air, pull once on the hose,” somebody calls; “if you don’t get enough, pull twice.” I wonder how I am to know whether I am getting too much or not enough, but there is no time to find out. I have just a moment for one deep breath from the outside, when there is no more “outside” for me; the face-glass has shut it off, and now grimy fingers are turning this glass in its threads, turning it hard, and hands are fussing with hose and life-line, making

them fast to lugs on the helmet-face, one on each side, so that the hose drops away under my left arm, and the life-line under my right. Then I feel a sharp tap on my big copper crown, which means I must start down. That is the signal.

I pause a moment to see if I can breathe, and find I can. One step downward, and I feel a tug at my trousers as the air-feed plumps them out. Step by step I enter the water; foot by foot the river rises to my waist, to my shoulders—to my head. With a roar in my ears, and a flash of silver bubbles, I sink beneath the surface; I reach the ladder's end, loose my hold on it, and sink, sink through an amber-colored region, slowly, easily, and land safely (thanks to Atkinson's careful handling) on the barge's deck just outside her combings, and can reach one heavy foot over the depth of her hold, where tons of coal await rescue. A jerk comes on the life-line, and I answer that all is well; indeed, I am pleasantly disappointed, thus far, in my sensations. It is true there is a pressure in my ears, but nothing of consequence (no doubt deeper it would have been different), and I feel rather a sense of exhilaration from my air-supply than any inconvenience. At every breath the whole suit heaves and settles with the lift and fall of my lungs. I carry my armor easily. It seems as if I have no weight at all, yet the scales would give me close to four hundred pounds.

The fact is, though I did not know it, my friends up in the daylight were pumping me down too much air (this in their eager desire to give enough), and I was in danger of becoming more buoyant than is good for a diver; in fact, if the clay-pipe gentleman had turned his wheel just a shade faster I should have traveled up in a rush—four hundred pounds and all. I learned afterward that Atkinson had an experience



THE AUTHOR AFTER HIS FIRST DIVE. THE FACE-PLATE HAS BEEN UNSCREWED FROM THE HELMET.

like this, one day, when a green tender mixed the signals and kept sending down more air every time he got a jerk for less. Atkinson was under a vessel's keel, patching a hole, and he hung on there as long as

he could, saying things to himself, while the suit swelled and swelled. Then he let go, and came to the surface so fast that he shot three feet out of the water, and startled the poor tender into dropping his line and taking to his heels.

Needless to say, that sort of thing is quite the reverse of amusing to a diver, who must be raised and lowered slowly (say at the speed of a lazy freight elevator) to escape bad head-pains from changing air-pressure.

I sat down on the deck and took note of things. The golden color of the water was due to the sunshine through it and the mud in it—a fine effect from a mean cause. For two or three feet I could see distinctly enough. I noticed how red my hands were from the squeeze of rubber wrist-bands. I felt the diving-suit over, and found the legs pressed hard against my body with the weight of water. I searched for the hammer and nail they had tied to me, and proceeded to drive the latter into the deck. I knew that divers use tools under water—the hammer, the saw, the crowbar, etc.—almost entirely by sense of feeling, and I wanted to see if I could do so. The thing proved easier than I had expected. I hit the nail on the head nearly every time. Nor did the water resistance matter much; my nail went home, and I was duly pleased. I breathed quicker, after this slight exertion, and recalled Atkinson's words about the great fatigue of work under water.

I stood up again and shuffled to the edge of the wreck. Strange to think that if I stepped off I should fall to the bottom (unless the life-line held me) just as surely as a man might fall to the ground from a housetop. I would not rise as a swimmer does. And then I felt the diver's utter helplessness: he cannot lift

himself; he cannot speak; he cannot save himself, except as those lines save him. Let them part, let one of them choke, and he dies instantly.

And now the steady braying of the air-pump beat sounded like cries of distress, and the noise in my ears grew like the roar of a train. All divers below hear this roaring, and it keeps them from any talking one with another: when two are down together, they communicate by taps and jerks, as they do with the tenders above. I bent my head back, and could see a stream of bubbles, large ones, rising, rising from the escape-valve like a ladder of glistening pearls. And clinging to my little windows were myriad tiny bubbles that rose slowly. The old Hackensack was boiling all about me, and I saw how there may well be reason in the belief of some that this ceaseless ebullition from the helmet (often accompanied by a phosphorescent light in the bubbles) is the diver's safeguard against creatures of the deep.

Well, I had had my experience, and all had gone well—a delightful experience, a thing distinctly worth the doing. It was time to feel for the life-line and give the three slow pulls. Where was the ladder now? I was a little uncertain, and understood how easily a diver (even old-timers have this trouble) may lose his bearings. There! one, two, three. And the answer comes straightway down the line—one, two, three. That means I must stand ready; they are about to lift me. Now the rope tightens under my arms, and easily, slowly, I rise, rise, and the golden water pales to silver, the bubbles boil faster, and I come to the surface by the ladder's side and grope again for its rungs. How heavy I have suddenly become without the river to buoy me! This climbing the ladder is the hardest task of all; it is like carrying two men on one's back. Again

I bend over the deck, and see hands moving at my windows. A twist, a tug, and off comes the face-glass, with a suck of air. The test is over.

“You done well,” is the greeting I receive; and the divers welcome me almost as one of their craft. Henceforth I have friends among these quiet men whose business it is to look danger in the eye (and look they do without flinching) as they fare over river and sea, and under river and sea, in search of wrecks.

THE BALLOONIST

I

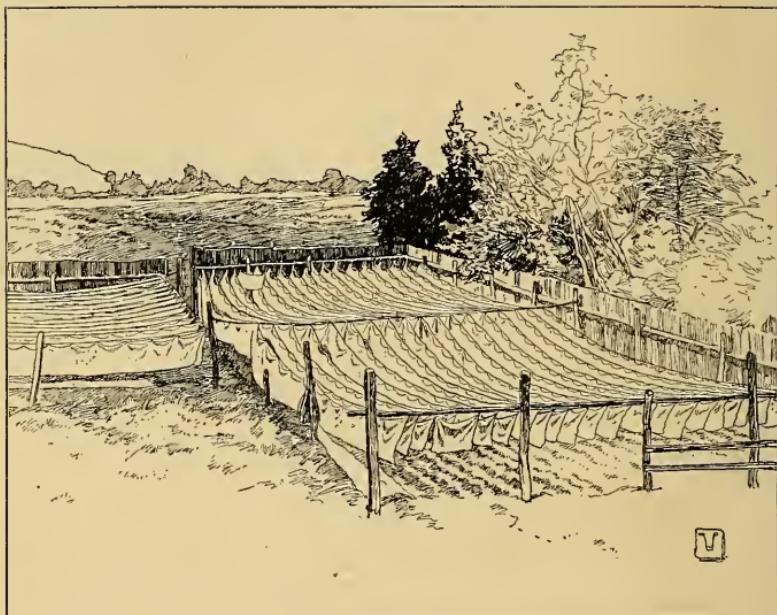
HERE WE VISIT A BALLOON FARM AND TALK
WITH THE MAN WHO RUNS IT

I NEVER knew a man who has been so many things (and been them all fairly well) as has Carl Myers of Frankfort, New York. They call him "Professor" Myers ever since he took to ballooning, years ago; but they might call him Dr. Myers, for he has studied medicine, or Wrestler Myers, for he is skilled in all tricks of assault and defense, Japanese and others, or Banker Myers, for he spent years in financial dealings, or Printer Myers, for he still sets up his own type, or Telegrapher Myers, or Lecturer Myers, or Carpenter Myers, or Photographer Myers.

All these callings (and some others) Myers has pursued with eagerness and success, only making a change when driven to it by his thirst for varied knowledge and his guiding principle, "I refuse to let this world bore me." To-day the professor is sixty years old (a thin, wiry, sharp-eyed little man), yet I suspect some boys of sixteen who read these pages feel older than he does. You ought to hear him laugh! or tell about the air-ship that has carried him over thirteen States! or describe his "balloon farm" at Frankfort! I don't know when I have enjoyed myself more than during three days Professor Myers spent with me some time ago.

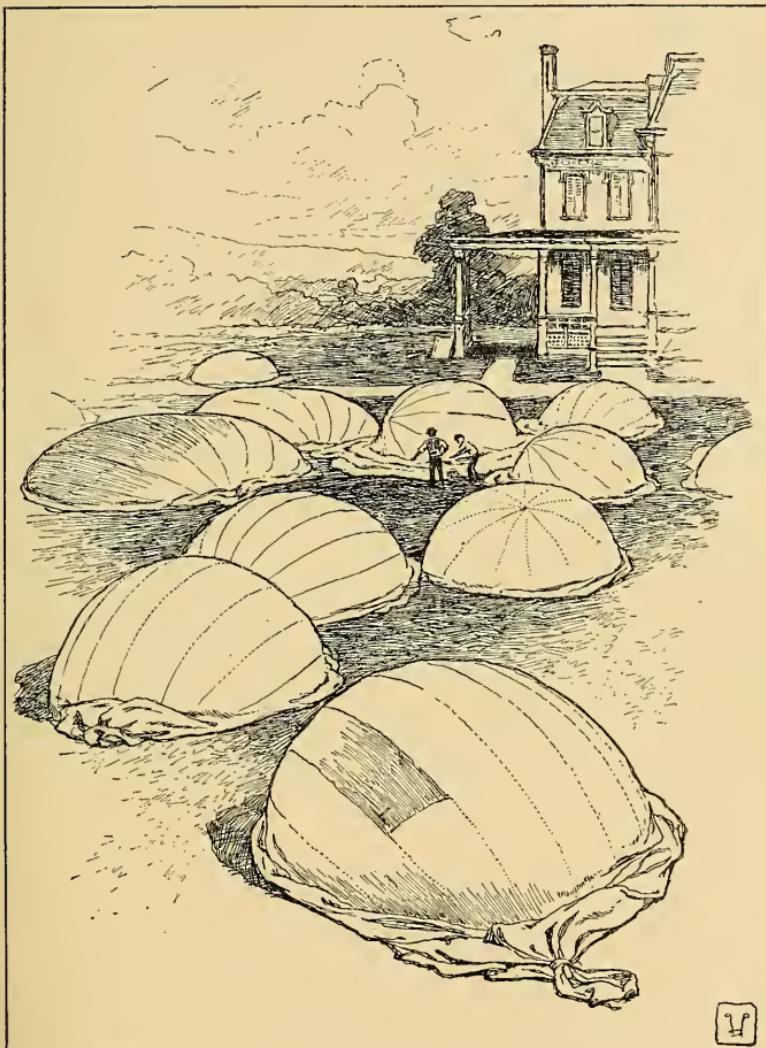
Suppose we begin with the balloon farm, which is

certainly a queer place. It is a joke in the neighborhood that the professor plants his balloon crop in the spring, gathers it in the fall, and stores it away through the winter. Certain it is that in summer-time the visitor (and visitors come in swarms) sees fields marked off in rows with stakes and cross-poles, on which bal-



“BALLOON-CLOTH BY HUNDREDS OF YARDS.”

loon-cloth by hundreds of yards seems to be growing (really, it is drying); and other fields, that look like an Eskimo village, with houses of crinkly yellowish stuff (really, half-inflated balloons); and groups of men boiling varnish in great kettles which are always getting on fire and may explode; and other men working nimbly at the knitting of nets; and others experimenting with parachutes; and the professor paddling away at the height of three thousand feet for his after-



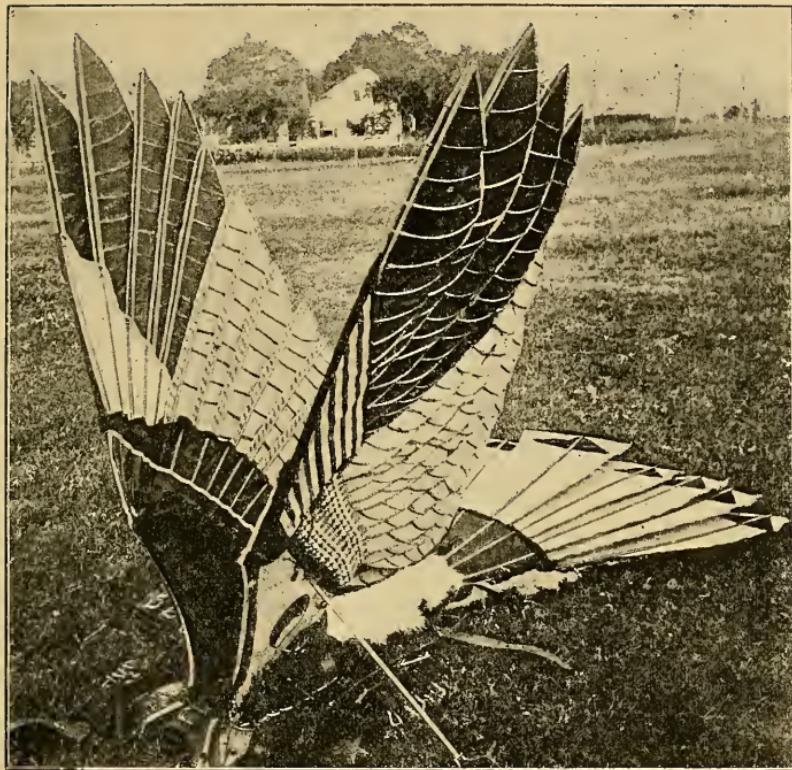
"FIELDS THAT LOOK LIKE AN ESKIMO VILLAGE."

noon "skycycle" sail; and Mme. Carlotta, the celebrated aëronaut (also the professor's wife), making an ascension now and then from the front lawn in a chosen one of her twenty-odd balloons.

And in winter, should you explore the upper rooms of the house, you would find all the balloons tucked away snugly in cocoons, as it were, fast asleep, ranged along the attic floor, each under its net, each ticketed with a record of its work, marked for good or bad conduct after it has been tested by master or mistress.

For weeks at a time in the experiment season a captive balloon hovers above the Frankfort farm, say twelve hundred feet up, and the tricks they play with that balloon would draw all the boys in the country, if their parents would let them go. Three guy-ropes hold the balloon steady like legs of an enormous tripod, and straight down from the netting a fourth rope hangs free. Now, imagine swinging on a rope twelve hundred feet long! They do that often for tests of flying-machines or aëroplanes—swing off the housetop, and sail away in a long, slow curve, just clearing the ground, and land on top of a windmill at the far side of the grounds. That's a swing worth talking about! And fancy a man hitched fast to this rope by shoulder-straps, and as he swings flapping a pair of great wings made of feathers and silk, and trying to steer with a ridiculous spreading tail of the same materials. The professor had a visit from such a man, who had spent years and a fortune in contriving this flying device, which, alas! would never fly.

Professor Myers, like most aéronauts, insists that traveling by balloon, for one who understands it, is no more perilous, but rather less so, than ordinary travel by rail or trolley or motor carriage. He points out that for thirty-odd years he and his wife have led a most active aéronaut existence, have done all things that are done in balloons, besides some new ones, and got no harm from it—some substantial good rather, notably an aërial torpedo (operated by electricity from



"A PAIR OF GREAT WINGS MADE OF FEATHERS AND SILK—WHICH,
ALAS! WOULD NEVER FLY."

the ground), which flies swiftly in any desired direction, its silken fans and aluminum propeller under perfect control from a switchboard; also the "skycycle" balloon, which lifts the aéronaut in a suspended saddle and allows him, by the help of sail propeller and flapping aéroplanes (these driven by hands and feet), to make a gain on the wind, when going with it, of ten or twelve miles an hour. On this "skycycle" Professor Myers has paddled hundreds of miles, not trying to go against the wind, but selecting currents from the many available ones that favor his purpose. "What is

the use," says he, "of fighting the wind when you can make the wind fight for you? People who take trains or boats wait for a certain hour or a certain tide, in the same way we wait for a certain wind current, and there is never long to wait, for the wind blows in totally different directions at different altitudes."

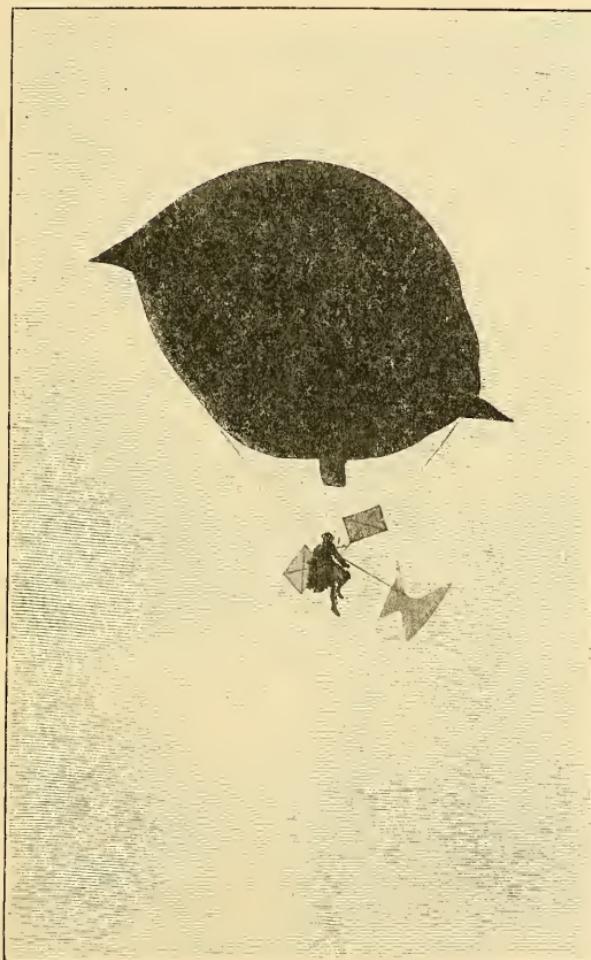
"Can you know with precision," I asked, "about these varying currents?"

"We can know a good deal by studying the clouds and by observations with kites and other instruments. And we would soon know much more if experimenters would work on these lines of conquering nature by yielding to her rather than opposing her."

In my talks with Professor Myers, of which there were many, we went first into the spectacular side of ballooning, the more obviously interesting part, stories of hair-breadth escapes and thrilling adventure, of the fair lady who assumed marriage vows sailing aloft over Herkimer County, of Carlotta's recent trip, ninety miles in sixty minutes with natural gas in the bag, of the English aéronaut who leaped from his car to death in the sea that a comrade might be saved through the lessened weight, of two lovesick Frenchmen who duelled with pistols from rival balloons, while all Paris gaped in wonder from the earth and shuddered when one silken bag, pierced by a well-aimed shot, dashed down to death with principal and second. And many more of that kind which, I must say, leave one far from convinced on the non-danger point.

Then the professor dwelt upon various odd things about balloons—this, for instance, that the rapid rise of an air-ship makes an aéronaut suffer the same pain and pressure on his ear-drums that a diver knows, only now the air presses from inside the head outward. And relief from this pain is found, as the diver finds it, by repeatedly opening the mouth and swallowing.

And he spoke of the strangest illusions of sight. The balloon is always standing still to the person in it,



PROFESSOR MYERS IN HIS "SKYCYCLE."

while the earth rushes madly along, forty, sixty, ninety miles an hour. As you shoot up the first half mile the ground beneath you seems to drop away into a deepening bowl, while the horizon sweeps up like a loosened

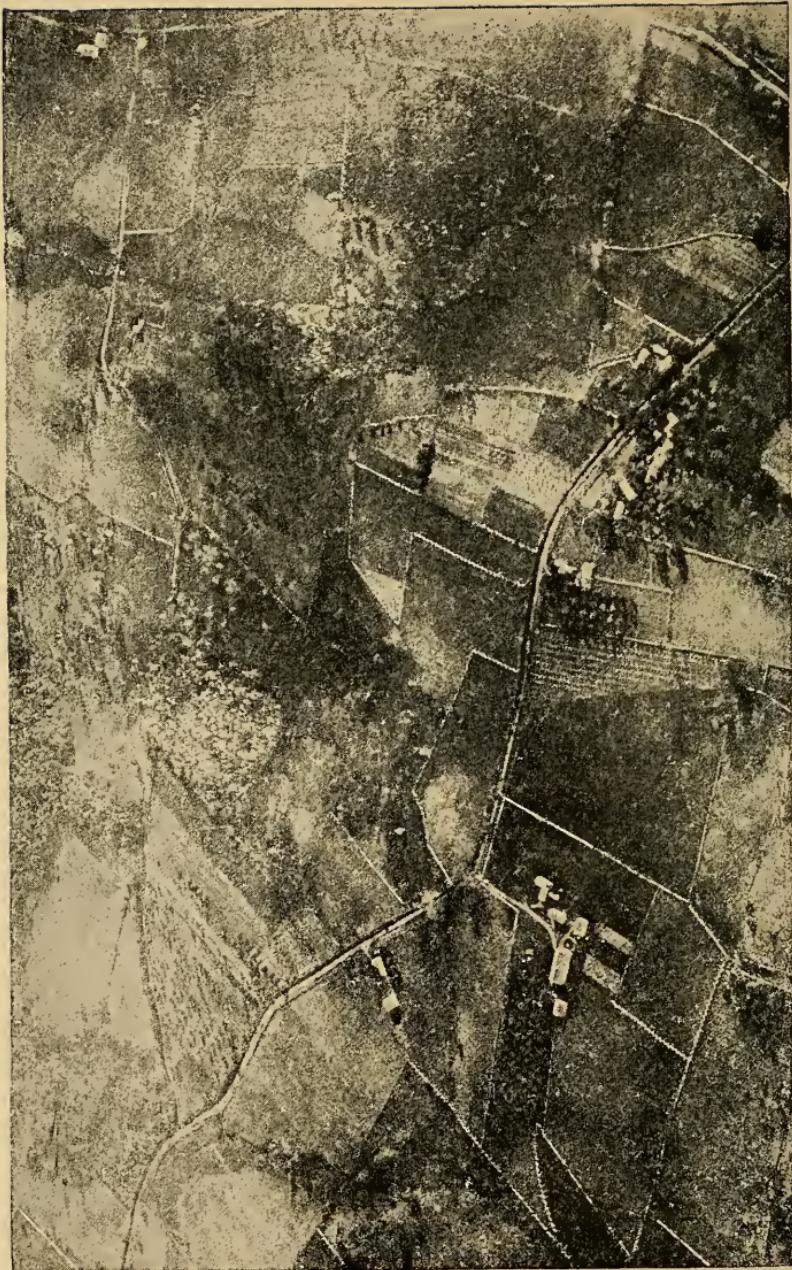
spring. Then presently this illusion passes, and you see everything flat. There are no hills any more, nor villages; no towers nor steep descents, only a level surface, marked charmingly in color, sometimes in wonderful mosaics, and strangely in light and shade. At the height of two miles nothing is familiar; you might as well be looking at the moon, for all you can recognize. Roads become yellowish lines; rivers brownish lines (and the water vanishes); a mountain-range becomes a shaded strip, with less shade on one edge (where the sun is) than on the other; a forest becomes a patch of color; a town another patch. There is scarcely any difference between water and land, and you see to the bottom of a lake, so that the configuration of its bed in valley and hill are apparent through the color and the shading. This singular disappearance of water bodies, for it amounts to almost that, has an evident importance.

"I 'll tell you what we did on Lake Ontario," said the professor, "as a result of observations I made there from a balloon. In sailing over the lake on one occasion I remarked a number of small shaded spots which puzzled me. I could. not imagine what they were. Finally, with the help of powerful field-glasses, I made them out to be wrecks sunk at various depths, and I realized that Lake Ontario, and indeed all the great lakes, abound in vessels which have gone down during centuries and never been recovered. No one can estimate the treasure which lies there waiting for some one to reclaim it. And I saw that it is a perfectly simple matter to locate these wrecks from a balloon, and to prove this I organized a modest wrecking expedition, and indicated to the diver where he was to go down. Down he went at that point, and found the wreck I had seen, and we pumped good coal out of her by hun-

dreds of tons. What I did then on a small scale might be done on a large scale by any one willing to undertake it."

Of course I asked the professor why it is that an aéronaut can see down into a lake better than, say, an observer in a boat, and he explained that there is a great gain in intensity of terrestrial illumination when the viewpoint is at a height, because the sun's rays converge toward the earth, the sun being so many times larger, and therefore (this is his theory) a man lifted above the earth gets many more solar rays reflected to him from a given area than he would get if nearer to that area. In a word, it is a matter of optics and angles, but, the professor declares, most assuredly a fact.

Never before these talks did I realize how busy an aéronaut is, how much there is to do in a balloon. Besides attending to valve-cords and ballast there is the barometer to keep your eyes on, for by it alone can you know your altitude. Around moves the needle slowly as you rise, slowly as you fall, one point for a thousand feet. Rising or falling, you know the worst or the best there. Sometimes the needle sticks, the barometer will not work, and you must cast overside pieces of tissue-paper to see by their rise or fall if you are going up or down. By your senses alone you cannot tell whether you are rising or falling, or your distance from the earth. That is most deceiving. Then you must have your watch ready to reckon your speed, so many thousand feet up or down in so many seconds, and your map spread out (nailed to a board, and that lashed fast), to tell where you are, and your compass out to fix the north and south points, for a balloon twists slowly all the time, twists one way going up and the other way coming down. Nobody knows just why



HOW THE EARTH LOOKS WHEN VIEWED FROM A HEIGHT OF ONE MILE.
(Photographed from a balloon.)

this is, unless it be the unequal drawing of the seams as the fabric swells and shrinks.

"I always keep the mouth of my balloon within easy reach," said the professor, "and play with it as an engineer does with his throttle-valve. Sometimes I even tie it shut when I am sailing, but that is dangerous."

"Why dangerous?"

"Because the balloon might ascend suddenly, and the expanding gas burst it."

"Can you see up into the balloon," I asked, "through the mouth?"

"Of course you can, and a beautiful sight it is. You look up through a round window, twenty inches or so in diameter, into the great bag, swelled out fifty or sixty feet in diameter, and perfectly tight, so that every line and veining of the net shows plainly through the silk in exquisite tracery, and wherever the sun strikes it you see a spread of gold and amber melting away in changing colors to the shaded parts. The balloon seems to be perfectly empty, perfectly still, yet it swings you upward and upward like a live thing. You get to feel that your balloon is alive."

"Does it make any noise?"

"Usually not. Now and then there is a creaking of the basket or a rustle of fabric, as you pass from one wind current to another, but as you drift along there is perfect stillness. I know nothing like the peace of a balloon sweeping in a storm. You feel like a disembodied spirit. You have no weight, no bonds; you fly faster than the swiftest express train. More than once Carlotta has raced a train going fifty miles an hour and beaten it."

"Is there danger to a balloon in a thunderstorm?"

"Apparently not, but it is terrifying to be in one. You seem to be at the very point where the lightning

starts and the thunder-crash is born. All about you are roarings and blinding flashes, and it rains up on you and down on you, and in on you from all sides. While I never heard of a free balloon being struck by lightning, it is a common thing for operators on the ground even in fair weather to get shocks of atmospheric electricity down the anchor ropes of captive balloons."

Our talk drifted on, and the professor told of exciting times reporting the great yacht races from captive balloons (with reporters turning seasick in the plunging basket), and remarkable phenomena observed from balloons and double colored shadows of balloons (called parhelions) cast on clouds, and wonderful light effects, as when a marveling aéronaut looks down upon a sea of silver clouds bathed in sunshine and through black clefts sees a snowstorm raging underneath.

I was surprised to learn that at very great altitudes, say above three miles, the voice almost fails to serve, or, rather, the rarefied air loses in great part its power of voice transmission, so that in the vast silent spaces of the sky one aéronaut must literally shout to another in the same basket to make himself heard. One would say that the great, calm heavens resent the chattering intrusion of noisy little men.

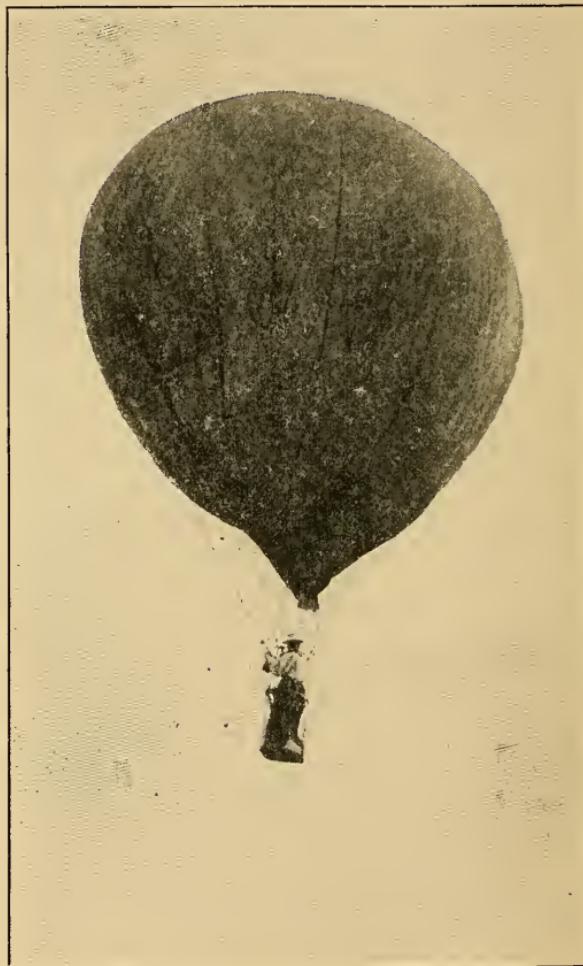
II

WHICH TREATS OF EXPERIMENTS IN STEERING BALLOONS

IN all their experiments at the farm, Professor Myers and Mme. Carlotta have worked on individual lines, he striving of late years to perfect his skycycle (which is simply a balloon of torpedo shape with a rigging of propellers and fans underneath), while she has been content to gain skill in steering a balloon of ordinary shape by merely moving her body and utilizing varying air-currents, for the wind blows in different directions as you ascend.

It is remarkable how the position of an aéronaut's body may alter a balloon's movements. It is possible, for instance, to make a balloon ascend or descend, without touching valve or ballast, by a simple change of position. Stand with your legs apart, straddling from edge to edge of the basket, and by throwing your weight first on one foot and then on the other you will give a polliwog movement to the big bag above you, and it will go wriggling upward head-first some hundreds of feet. Or if you would make it descend (all this the professor explained to me), stand with your feet together in the middle of the basket, and, catching the balloon-neck at both sides, stretch your arms wide apart so that the fabric forms a chisel-edge, then sway your hips forward as far as you can, then back as far as you can, and keep doing this. Now the wriggling

process is reversed; and this time the basket goes first, "tail wagging the dog," and the balloon descends.



MME. CARLOTTA STEERING A BALLOON BY TIPPING THE
FOOT-BOARD.

This ability to rise or fall at will allows Mme. Carlotta to pass easily from one train of clouds to another, and, by long study of these cross-moving aerial trains,

she is able to pick out the one she wants for a certain destination with almost the precision of a foot-passenger selecting his particular street-car or changing from one to another. And in descending she has learned to steer forward or back, to left or right, by tipping the basket foot-board in the direction she wishes to take. The balloon follows the lowest edge of the foot-board as a ship follows her rudder.

An almost incredible instance of the skill attained by Carlotta in these experiments was furnished some dozen years ago at Ottawa, where she made an ascension never forgotten by the people of that city. It was a grand occasion in honor of Queen Victoria's gift of the Crystal Palace to her loyal subjects, and Canada had rarely seen such a gathering. Twenty-five thousand people, as was estimated, were packed inside the Exposition grounds to see the aéronaut rise to the clouds. And there at the appointed time stood Carlotta on a raised platform, with the multitude about her, waiting for the balloon. She wore a short skirt over a gymnasium suit, and made an attractive picture with her fine figure and golden-bronze hair. So thought various city dignitaries, who chatted with her admiringly while the crowd surged about them.

Meantime Professor Myers was anxiously watching the manœuvres of some Indians hired by a committee to tow the balloon from gas-works two miles distant, where it had been filled. This was rather against the professor's judgment, for the Rideau River, flowing by the grounds, offered an obstacle that could be overcome only with the help of canoes and tow-lines; and to paddle a big balloon across a river, a fresh-filled, hard-tugging balloon, is not a thing to be undertaken lightly. And in spite of all their skill these Indians found themselves presently lifted into the air, canoes and all (oh,

they were badly frightened Indians!), not quite clear of the water, but high enough to make it doubtful if they would ever reach shore, and highly interesting to the crowd which pressed down to the river, even into the river, in well-meant efforts to help, and dragged the balloon up the bank and along toward the platform with such eagerness that they tore great rents in it that let out the gas in volumes.

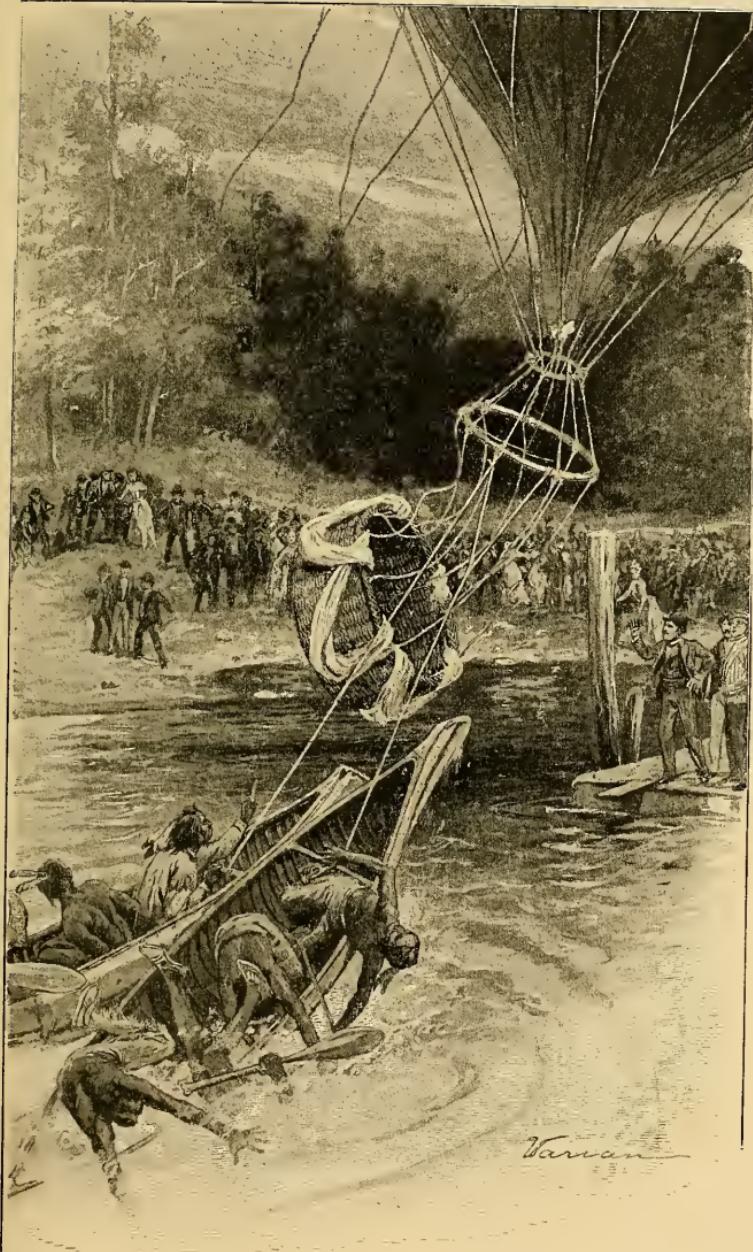
In an instant, as happens in crowds, the balloon became the center of a struggling mass of people, who slowly pressed in from all sides to see what the matter was. Now, when twenty-five thousand people are all pressing slowly toward one point, it is apt to fare ill with those at that point; and had not Carlotta acted on a flash of inspiration there would surely have been disaster in that merciless crush. She looked over the shouting, swaying multitude, and in a second saw the danger—saw women held helpless and fainting in that jam of bodies; saw one way, and only one, to save the situation, and took that way. Stepping off the platform, she ran lightly and swiftly over heads and shoulders, packed solid, and came to the balloon. Such was the people's fright that they scarcely felt her pass.

"You can't go up," cried her husband; "the balloon is a wreck."

"I must go up," she answered; "if I don't these people will be crushed to death."

"There 's a hole in her big enough to drive a team through," he protested; but already she was in the basket, and a great cheer arose.

"It 's better to risk one life than many," she answered with decision, and, turning to the crowd, motioned them to loose the car. In their wonder the mad multitude forgot their fear, and the struggling quieted. All eyes were now on the balloon; one woman's cour-



"IN SPITE OF ALL THEIR SKILL THESE INDIANS FOUND THEMSELVES PRESENTLY
LIFTED INTO THE AIR, CANOES AND ALL."

age had quelled the panic. The danger to the crowd was past, to the woman just beginning.

"Wait a moment," shouted Professor Myers; "you must have more ballast." But in the din of voices she misunderstood him and cast out the last bag. Then, with a great heave and a flapping of its torn sides, the balloon wrenched itself free and shot upward, a cripple soaring with its last strength. Up and up it went, higher and higher as the small store of gas expanded. That tattered balloon, with its seams gaping open, raised itself somehow two miles over the city of Ottawa, and then almost immediately began to fall. The gas stayed in just long enough to lift the broken bag, and then left it to dash downward. Professor Myers, heart-sick on the ground, turned his eyes away, sure that he had seen his wife alive for the last time.

But Carlotta was of no such mind. She had saved the crowd, now she would save herself; and even as the balloon dropped with frightful speed, she put her plan into action. Swinging herself up on the netting, she caught the flapping silk above a long tear, and drew it down with all her weight until it reached the car. Instantly the air rushed in underneath, and bellied out the fabric into a great umbrella, a parachute improvised from a ripped balloon. Now they were slowing up; they had put the brakes on, and now they were soaring easily, drifting with the wind. Carlotta drew a long breath of relief and looked down. They were still a mile above ground. She had the runaway in hand, but where should she land him? Most aéronauts would have been thankful enough to get down alive anywhere; she proposed to do a feat of steering as well. No doubt there was some gas in the upper part of the bag to help her, but in the main she was guiding a parachute; and she guided it so skilfully by tipping the foot-

board forward or back, to left or right, that she landed finally in a clump of evergreen-trees, some fifteen miles from Ottawa, that she had selected as the very place she proposed to land. And great were the rejoicings when it was known that she had come to no harm.

The story had an interesting sequel the following year, when Carlotta made another ascension from the same place.

“Where will you land this time?” one of the committee asked her.

Carlotta looked at the clouds a moment, then, smiling, said, “If you like, I will land exactly where I did last year.”

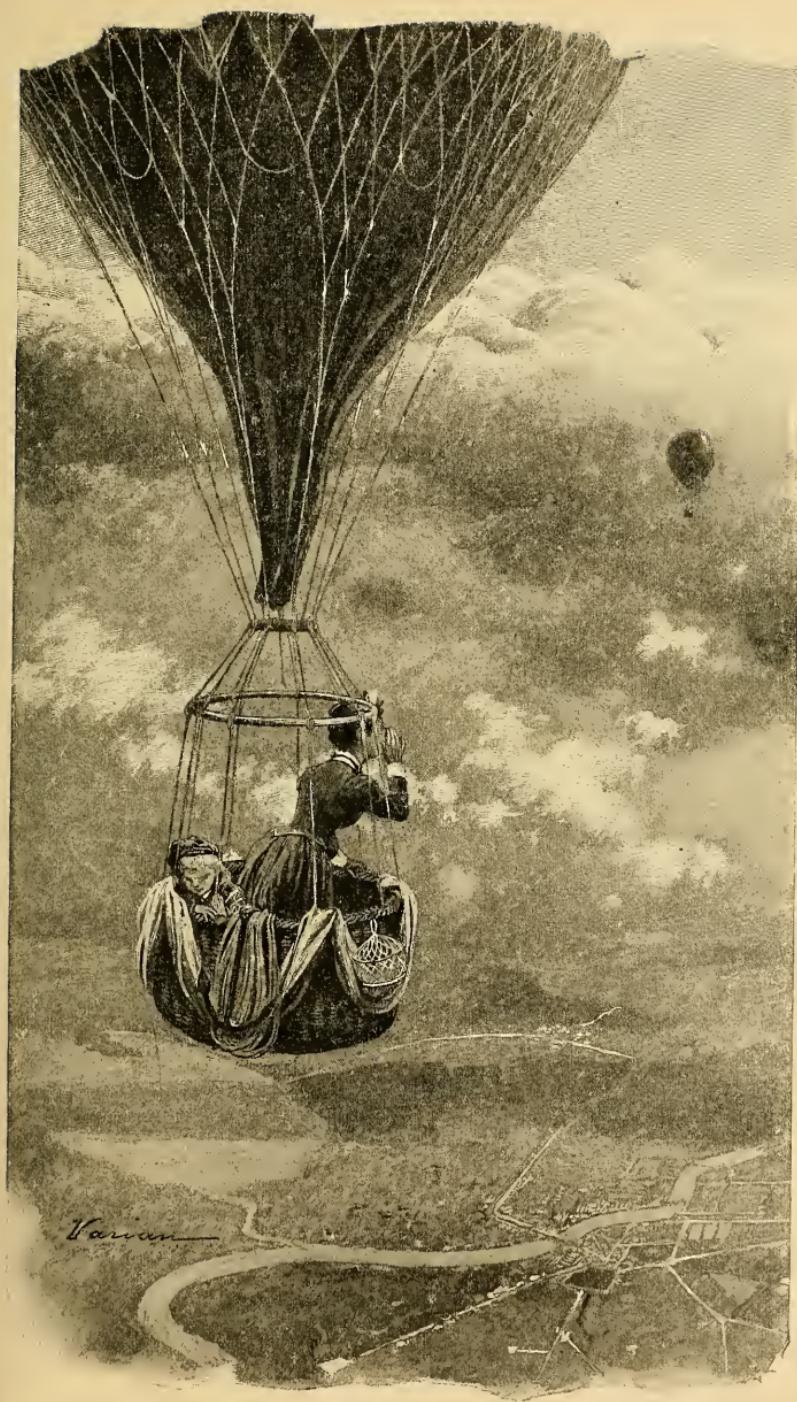
This they all declared impossible, for the wind was strong in just the opposite direction; but Carlotta insisted she would land in that clump of evergreens and nowhere else. And she kept her word. She had observed that at a certain height the wind was favorable to her purpose, and by the same tactics of seeking the right wind-currents and by the same clever foot-board tipping she reached the point she was steering for, to the general wonder and admiration.

My acquaintance with Professor Myers has given me some light on a question often in my mind; that is, what kind of children these men have who follow careers of danger and daring. Will the son of a steeple-climber climb steeples? Will the daughter of a lion-tamer be afraid of a mouse? And so on. Of course, with both father and mother aéronauts, as in this case, it would be strange indeed if their child did not love balloons; and so it has turned out, for Miss Aërial Myers, now a girl in her teens, has already made various ascensions, and enjoys nothing better than soaring aloft on her father’s skycycle, which she steers skilfully. Her first experience of a voyage in the air is

memorable for two facts, that it nearly brought destruction to herself and her mother, and drew attention to an important but little-known fact in ballooning science.

It was some years ago, at the Syracuse County Fair, and a balloon race had been advertised between Carlotta and young Tysdell, an assistant of Professor Myers. For this event an enormous crowd had gathered on the grounds. And now (by what tears and pleadings who can say?) Miss Aërial, aged eleven, had persuaded her too fond mother to take her along, and off they went, amid cheers and wavings, with a strong breeze blowing, and the child peering down at the dwindling earth over the basket-side. She watched the roads change into yellow streaks, and the hills swing up from back of the horizon, and the clouds spread away below them like a sea. She watched her mother take readings of compass and barometer, and as the wind swept them along to new view-points she would cry out, "Here comes another town, mama!" and clap her hands as the town raced by.

Tysdell won the race, having ballast in plenty to throw out, while Carlotta had little, since the extra lifting-power of her balloon was needed for Miss Aërial. Now, the difficulty of managing a balloon is much increased if you have no ballast, for then you cannot rise at will to enter a higher wind-current blowing the way you want to go, but must drift where the current you are in may take you. And the current they were in took them (such is the perversity of things) straight toward a deep and dangerous lake. Carlotta saw where they were going, but was powerless to prevent it. She could not throw Miss Aërial overboard like a sand-bag to make the balloon go higher, although she did throw overboard everything else that was movable, even to her jacket and shoes. Then, having done



MME. CARLOTTA CALLS FOR ASSISTANCE FROM ANOTHER BALLOONIST
THREE MILES AWAY.

all that was possible, she waited, clutching the basket-sides with anxious fingers, and wondering if there was any way to safety.

Suddenly an idea came to her, and she scanned the heavens for Tysdell's balloon. No sight of it anywhere. Tysdell was three miles away, hidden by clouds. Nevertheless she lifted her voice and sent forth a loud cry, calling his name. Immediately the answer came, quite distinct. She explained their peril, and asked Tysdell if he could come to them. He said he would try, and questioned her where they were and what wind-currents had borne them. Carlotta told Tysdell to what height he must drop (she knew her own height by the barometer), and in a very few minutes, being able to rise and fall as he pleased, he was near the two other air-sailors, and got his balloon down by the lake-side in time to help them ashore when they struck, as presently they did. The basket splashed the water, then skipped along the surface under the drag of the balloon, and was caught finally in the arms of a tree that reached out from the bank. And the only harm done was the spoiling of Miss Aërial's best frock!

Here was a case of conversation carried on easily between two balloons a mile or so above the earth and three miles apart. But other experiments made by Mme. Carlotta show that talking between balloons may go on over much greater distances, a reach of nearly eight miles having been accomplished on one occasion near Ogdensburg, New York. The explanation of this phenomenon is perfectly simple. Each balloon, while it is speaking, acts as a huge megaphone for the other, and each balloon, while it is listening, acts as a huge sounding-board for the other; and the tighter the balloons are kept under pressure of gas, the easier it is to

make these great silken horns (for such they are) throw forth and receive the messages. It should be noted that this facility for voice transmission does not exist at great heights because of the rarefied air. At a mile above earth, however, this difficulty is not presented, and it may be that a superior kind of wireless telegraphy will be introduced some day by the use of talking balloons. Why not?

III

SOMETHING ABOUT EXPLOSIVE BALLOONS AND THE WONDERS OF HYDROGEN

ONE day the professor told me about some rainfall experiments with balloons that he conducted years ago for the government. There was a theory to be tested that loud explosions at a height will make the clouds pour down water, and some gentlemen in the Department of Agriculture were anxious to set off as loud an explosion as possible, say a thousand feet up in the air. Professor Myers received this commission, and proceeded at once to Washington with a gas-balloon twelve feet in diameter.

“Don’t you think that balloon is rather small?” asked one of the gentlemen.

“No,” said Myers; “I should call it rather large.”

The other man shook his head. “I’m afraid it won’t make noise enough to test our theory.”

“Well,” said the professor (I can see his eyes twinkling), “if this balloon does n’t make noise enough we’ll get a bigger one.”

They took the balloon some miles out of Washington (the professor insisted on this), filled it with a terribly explosive mixture of oxygen and hydrogen, and sent it up about a quarter of a mile, with an anchor-rope holding it and a wire hanging down to a little hand-dynamo or blasting-machine. As they made ready to turn this dynamo, Professor Myers lay flat

on his back, eyes glued to the balloon, confident but curious. The handle turned, a spark jumped at the other end, and the ball of silk seemed to swell enormously and then vanish with a flash of a thousand shivers of silk. On this came the sound—a smashing and tearing blast louder than any thunder-crash or roar of cannon. It flattened men to the ground, killed hundreds of little fish in a stream near by (bursting their air-bladders), knocked over a bowling-alley like a house of cards, frightened cattle, and brought down rain in torrents within eight minutes. The Agricultural gentlemen were more than satisfied, and adopted the professor's system for extended rainfall experiments—only these (for obvious reasons) were removed to the lonely and arid plains of distant Texas.

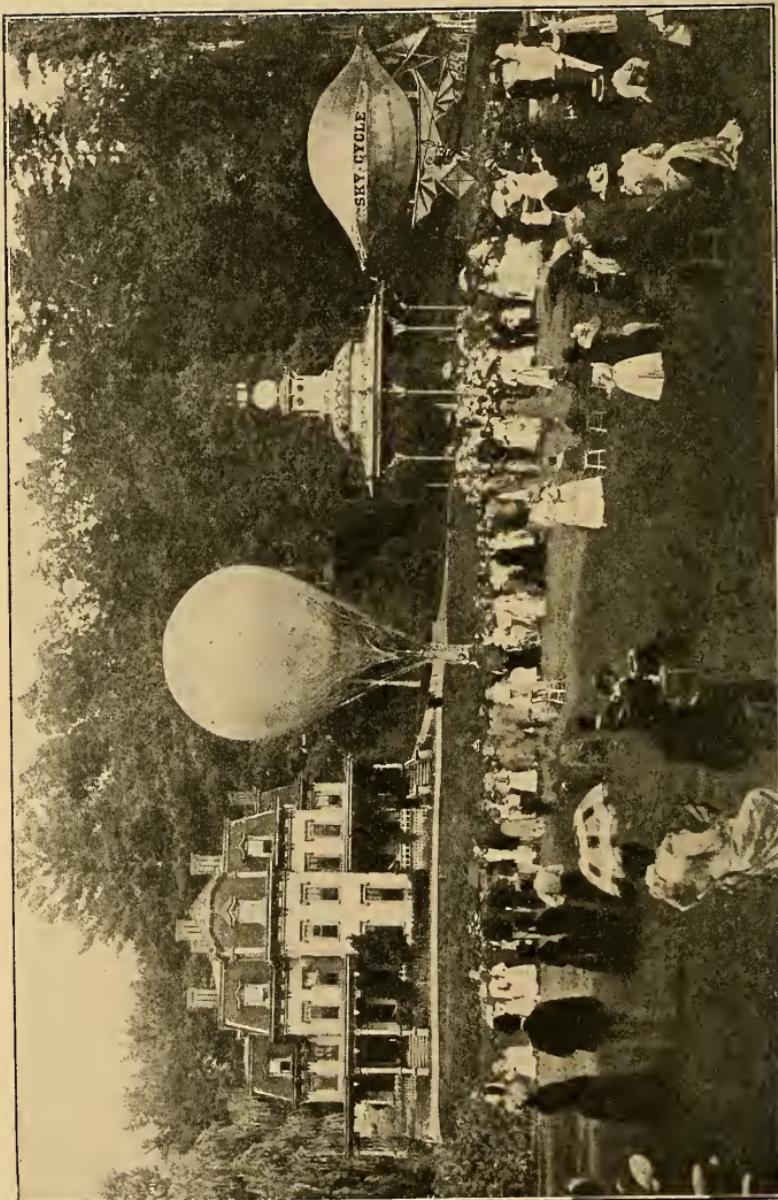
"It was n't much fun living down there," said the professor; "but we got rain whenever we wanted it."

"What would happen," I inquired, "if a very large balloon filled with this explosive mixture were set off over a crowded city?"

The professor shook his head in his awed contemplation of this possibility. "It would work fearful destruction. If large enough (and there is no difficulty in obtaining such a size), it would wipe out of existence whole blocks of houses and the people in them. It would destroy an army."

In the course of our talks I discovered a mystic side, very unexpected, in the professor's nature. He used to speak of hydrogen, for instance, with a certain almost reverence, as if it were something endowed with life and consciousness, a powerful spirit, one would say, not merely a commonplace product of chemistry, a gas from a retort.

"I have often wondered," he said one day, "as my basket has swept me along, what there is in this silken



A BALLOON-PICNIC AT THE AÉRONAUTS' HOME.

bag above me that lifts me thus over mountains and cities. I look up into the balloon through the open mouth, and I see nothing; I hear nothing; I smell nothing. None of my senses answer any call; yet somehow, strangely, in a way I can't explain, I *perceive* a presence. It would not be at all the same to me were the balloon filled with air, though it would be the same to all my senses. Again and again I have noted this thing, that hydrogen makes itself known to men when they are near it."

He paused a moment as if to observe my attitude, to see if it were one of scoffing. I made no remark, but begged him to go on.

"After all," he continued, "even the books allow to hydrogen properties that are very amazing. It is the lightest of all things; it passes through and beyond all things; it is the nearest approach we know of to absolute nothing. Who can say that it is not related to the land of nothing, to—" He hesitated.

"You mean?" said I.

"I don't know what I mean. I only wonder. Take this case that happened at Ogdensburg, New York, during an ascension we made there. We had filled the balloon with hydrogen, and were just ready to start when the valve-cords that hang down inside the bag from the valve at the top became twisted and drew up out of reach from the basket. In vain I tried to get them free by poking at them with sticks and long-handled things; the cords would not come down, and of course no sane man would make an ascension with his balloon-valve beyond control. There was nothing for it but to get inside that great gas-bag and undo the tangle with my hands. So I called fifteen or twenty men to catch hold of the netting and pull the struggling balloon down over me until I could reach the cords. Then I—"

“Wait a minute,” I interrupted. “Were you standing inside the balloon so that you had to breathe hydrogen?”

The professor smiled. “I stood inside the balloon, but I breathed nothing; I held my breath, which is one of the things I have practised. Before I went inside I told my wife to note the time by her watch, and if I did not come out before one hundred and twenty seconds had passed to have the men drag me out. You see, I knew I could hold my breath one hundred and twenty seconds, but no longer.

“Well, we carried out the plan, and I freed the cords in less than my limit of time; then came the uncanny part of it—at least, it seemed so to me. I had read that hydrogen will not transmit sound, but had never tested it. It is true I had at various times taken hydrogen into my lungs, but never had I tried to speak in hydrogen. Now was my chance, and, with all my remaining breath I shouted as loud as I could inside that balloon. Think of it; there were my wife and the men a few feet distant, with only the thinnest tissue of silk between us, and a gas that was like nothing. Yet my cry, that would have reached perhaps half a mile in air, could not penetrate that little void. To those outside the balloon it was as if I had not opened my lips. They heard nothing, not even a whisper. I believe you might fire a cannon inside a bag of hydrogen, and no faintest rustle of the discharge would reach your ears. So, you see, a world of hydrogen would be a voiceless world.”

“Did you say you have breathed hydrogen?” I asked.

“Yes; I have breathed it up to the danger-point. I know all the sensations. There is first a mild exhilaration, then a sense of sickening and head-throbbing, and finally a delicious languor that leads into stupor.

When you get there it is time to stop. In making ascensions we have to be very careful not to breathe too much gas from the balloon-neck which hangs open over the basket. More than one aéronaut has been gradually overcome without realizing that he was in danger."

The professor went on to tell of other singular things about this subtle gas, notably that, speaking within limits, the higher you want a balloon to rise, the *less* hydrogen you must put in it. If you fill a balloon full of hydrogen it will rise to no great height (and is very apt to burst), since the gas has no space to expand in, and the way to keep a balloon rising is to make it expand more and more as it goes up, each foot of added volume displacing a foot of the air-ocean and to that extent adding buoyancy.

"General Hazen and I," said the professor, "once planned that some day, when we got an appropriation, we would go up in a balloon having a capacity of, say, forty thousand cubic feet, but carrying at the ground only ten thousand cubic feet of hydrogen—in other words, in a shrunken, quarter-filled balloon. Of course as we rose and the air became rarefied this hydrogen would expand against the decreasing air-pressure, and at a height of two miles our original ten thousand feet of gas might have swelled to twenty thousand feet, at five miles to thirty thousand feet, and so on. The last ten thousand feet of expansion would have brought us to no one knows what height, but certainly, we calculated, to the greatest height ever reached by a balloonist."

He explained that the balloon record of seven miles claimed for Glaischer and Coxwell, the English aéronauts, is not reliable, since the barometer used in that famous ascension (it was made at Wolverhampton,

England, in 1862) could not register above five miles, and what was accomplished beyond that height is matter of pure conjecture and must be less than might be done by the Hazen-Myers plan, since Glaischer's balloon (by a serious oversight) was started on its flight nearly full of hydrogen, instead of nearly empty.

"Oh," exclaimed the professor, with regretful look, "why don't some of our very rich men think of these things!"

IV

THE STORY OF A BOY WHO RAN AWAY IN A BIG BALLOON

ONE of the professor's hobbies is that gas-balloons are better and safer than the hot-air kind, although the latter cost less to operate. Your hot-air balloon goes up with a rush, but comes down again as soon as it cools; and in the coming down lies the danger. A gas-balloon, on the other hand, stays up as long as you keep gas in it, and the professor's secret of varnishing holds gas like a trap.

As to the ordinary use of hot-air balloons for parachute dropping, the professor has only condemnation. A parachute, says he, is a sin and a disgrace—a thing to be prohibited by law. The parachute kills more people every year (the professor still is talking) than many a battle, and kills them in unpleasant ways: drops them on live electric wires, which shock them to death; drops them in lakes, where they are drowned, or in the ocean, where they are eaten by sharks; drops them in trees, where they catch by their coat-collars and choke to death; drops them on sharp railings, which spear them through; drops them—but the professor's list (backed by statistics, be it said) is too long and gruesome. It is only fair to add that I have a friend, Leo Stevens, a professional aéronaut, who has made thou-

sands of drops from hot-air balloons and claims that nothing is safer than a parachute, and says he can steer one in its downward sailing so as to avoid dangerous landing-places, although he does admit numerous hair-breadth escapes, as when he dropped from a parachute two miles out at sea, this at Long Branch in 1898, and was only saved by his life-preserved and the courage of some fishermen, or again when De IVE, his partner in ballooning ventures, dropped with him on one occasion from a big balloon (one parachute was suspended on either side), and landed in Lake Canandaigua and was drowned. "Oh, there's no doubt a man takes chances on a parachute," said Stevens, "but I like it."

There is a singular thing about parachutes, Stevens contends, not sufficiently considered by Professor Myers in his experiments. The professor, with his usual thoroughness, has tested all shapes and kinds of parachutes by dropping them from a captive balloon with a sand-bag hitched on instead of a man. The dropping was done by a fuse which would burn the supporting rope and at a given moment set the parachute free, just as a man under the parachute would cut it free. And in a large number of cases the parachute did not open in time to save the sand-bag man from destruction on the ground.

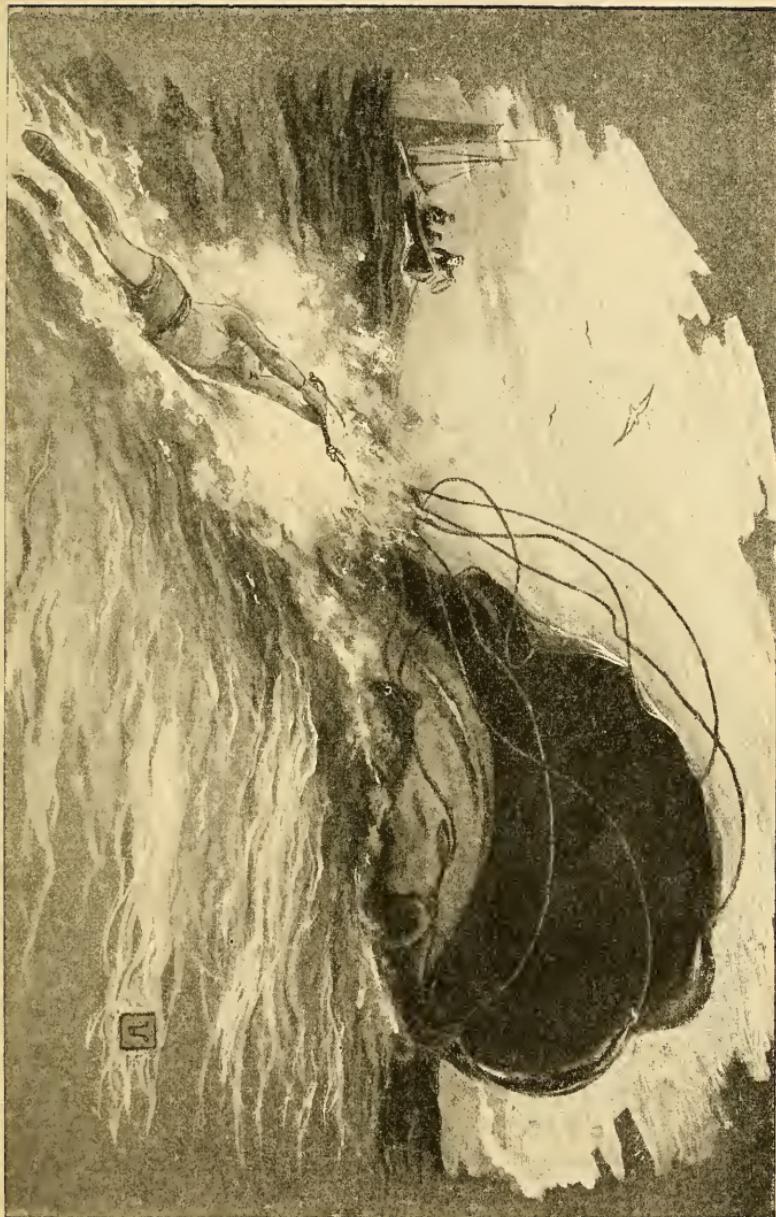
"That proves," argues the professor, "that parachutes are extremely dangerous."

"Nothing of the sort," answers Leo Stevens; "it only proves that there is a big difference between a sand-bag man and a real man. The sand-bag is dead weight, and the man is live weight. A parachute will open for the one where it won't open for the other."

"Why will it," queries the professor, "if the man and the sand-bag weigh the same?"

"I don't know why, but it will," Stevens insists.

"STEVENS CAME DOWN ONCE WITH A PARACHUTE TWO MILES OUT IN THE ATLANTIC OCEAN—AND WAS PROMPTLY RESCUED."



"If what you say were true I 'd be dead long ago, and my wife, and all my assistants."

I well remember my first visit to aéronaut Stevens at his little balloon establishment on Third Avenue, a rambling, go-as-you-please attic, with things strewn about anyhow, lengths of balloon-cloth hanging from rafters for the varnish to dry, crinkly yellow segments of balloons heaped near a sewing-machine that was stitching them into spheres, rows of hot-air balloons from past seasons ranged along on shelves in tight bundles, models of flying-machines, all kinds of parachutes, including one in red, white, and blue, made to take up a dog, and in various dusty corners photographs of Leo Stevens walking a tight rope, Leo Stevens rising to the clouds over waving multitudes, Leo Stevens (and his big umbrella) soaring down to earth from the height of twenty steeples, swinging with dancing-master grace from the bar of his trapeze. I liked this place for the good-natured faces of "Kid" Benjamin, who was scooping cold salmon out of a can when I came in, and a young lady with long eyelashes, who was running the machine.

Leo Stevens was out, said this young lady; he was seeing some patent lawyers about his new air-ship, but she was Mrs. Stevens, and could she do anything for me? I asked various questions, and she answered them from a wide practical knowledge. She had made dozens of balloons and parachutes—yes, and used them, too. It was "Kid" Benjamin who offered this latter information, remarking that she was "grand on a parachute."

Mrs. Stevens smiled, and explained that she had never made an ascension in her life until the previous summer, and then only because her husband was in a fix through the failure of another woman to appear. A

balloon race had been advertised between two lady aéronauts, and when the time came one of them, Miss Nina Madison, was missing. Rather than have the thing a failure and a big crowd disappointed, Mrs. Stevens agreed to go up. She would take Miss Nina's place and race the professional. And she did it, and she won the race.

"You see," she said, "I did n't feel nervous as another woman might, because I 'd been living with balloons for years. Besides they hitched me fast to the parachute ropes so I could n't have fallen if I 'd wanted to. It was lovely going up; everybody said we made a beautiful ascension, and the two balloons kept so close together that the other lady and I were talking all the way. At last, when we were up about three thousand feet, she called out that my balloon was settling and for me to cut. But I called back: 'Cut yourself,' and, sure enough, she did in a minute, and I watched her parachute open out and sink and get smaller and smaller, until she reached the ground. A few minutes later, when I saw my balloon had really settled, I cut, too. H-o-o-o, what a sensation! You know those awful dreams where you fall and fall? Well, it 's just like that for two or three seconds, until your parachute fills wide and springs you up against the ropes. Then you sail down, down, with a lovely easy motion until you get close to the ground. But look out for the landing. Once I struck in a treetop. And you 're liable to come down on houses or anything."

"You 're liable to come down in the middle of a lake," put in "Kid" Benjamin.

"Do you go up?" said I to the "Kid," whose hands and face showed black smears from painting balloon-cloth. He was certainly not over eighteen.

"Do I?" he answered, with a grin. "I made more 'n twenty ascensions and drops last summer."

"He 's the one," said Mrs. Stevens, "who carried that boy up hanging from the parachute ropes. Don't you remember? At Coney Island? The boy was helping hold the balloon, and when she started his foot got caught."

"And he went up hanging by his foot?"

The "Kid" nodded. "Yep, stuck fast in the rigging by one shoe. As I sat on the trapeze bar there was that boy forty feet above me kicking and yelling. Say, you 'd never guess what he was yelling about."

"I suppose he was afraid?"

The "Kid" shook his head. "No, sir; he did n't seem to mind the eight hundred feet we 'd gone up, not a bit. What worried him was sixty cents in pennies and nickels that had spilled out of his pants pockets while he was upside down."

Then the "Kid" explained how he postponed his parachute drop on this occasion and got down safely, boy and all, by letting the balloon cool off and gradually settle to the ground.

"Is n't a parachute pretty long when it hangs down?" I asked.

"Certainly. It 's thirty-five feet from where she hitches on t' the balloon to where you sit on the bar. That 's length o' ropes and length o' cloth both."

"Then, how can you cut her loose from 'way down on the bar?"

"I 'll tell you," put in Mrs. Stevens. "You just pull a tape that hangs down inside the parachute from a cutaway-block at the parachute head. The holding-rope passes through that block, and there 's a knife-blade in the block over the rope. The tape pulls the knife-blade down, and away you go. It 's one of my

husband's inventions." She was plainly very proud of her husband.

Presently entered Leo Stevens himself, a surprisingly young man for such a veteran, scarcely over thirty, the explanation being that he began ballooning as a mere child. Before he was ten he had gained some mastery of slack-wire feats, and at thirteen he was known over the country as Prince Leo, a marvel of the air, in black and gold, making the fortune of some gentlemen who exploited him.

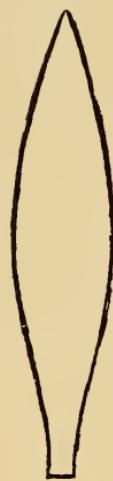
His arrival recalled the object of my visit, which was to get from him some practical ideas for balloon and parachute experiments on a small scale, the sort of thing boys might undertake in their own backyards; and, on learning this, Stevens caught my idea at once. He knew just what I wanted, and was glad to help me. He liked boys himself, and we settled down forthwith to a consideration of segments and materials and dimensions and, after a little planning and measuring, he had the problem solved.

"A hot-air balloon is the easiest and cheapest for boys to make," said Stevens, "and it goes up with more of a rush than a gas balloon. So we 'll tell them how to make a hot-air balloon. I remember a boys' balloon picnic that I got up one summer at Chautauqua Lake while I was making ascensions there. What fun those boys did have! We sent up a kitten in a strawberry basket, strapped fast, you know, so she could n't fall out, and the basket hung from the parachute by a time fuse that burned loose about a thousand feet up, and down came the whole thing, parachute, kitten, and all, sailing beautifully and landing as easily as you please. It never hurt the kitten at all. But the balloon drifted nearly a mile away across a swamp and stuck in a big tree. What a time those boys had chas-

ing it and climbing after it and slopping home with it after dark through the swamp, with lanterns and torches! I suppose they got well spanked, a good many of them, but boys don't mind."

"How big was this balloon?"

"About eleven feet high, inflated; that's a good size. I mean eleven feet high inflated, but the segments must be cut out eighteen feet long to allow for the curve. See," and he made a sketch of a single segment.



"There must be fourteen segments like this, each one eighteen feet long and two feet wide at the widest part, then tapering to a point at one end, the top, and to a width of five inches at the other end, the mouth, which must be left open. These segments are made from ordinary sheets of tissue paper, first pasted into long sheets (use ordinary starch paste) and then cut out after the pattern. Then the fourteen segments must be pasted together lengthwise along the edges, and they will form a balloon with enough lifting power to take up a parachute and small passenger, say a kitten or a puppy."

"We must tell them how to fill this balloon with hot air," I suggested.

"That's so," said Stevens. "Well, it's very simple. They must dig a trench, in the yard or somewhere, five feet long and one foot deep, with a hole dug at one end for a fire. Then they must cover over the trench with pieces of tin and spread dirt over that, and boards over all; this is for a good draught. Then they must make a fire in the hole at one end of the trench out of barrel-staves or anything that will give a hot flame, and toward the last they might throw on a little kerosene.

That 's exactly the way we make our fires for big ascensions.

"At the other end of the trench they must fix a length of stove-pipe sticking straight up out of the draught-hole into the mouth of the balloon and four or five boys must stand around on fences and boxes to hold the side of the balloon away from the fire which will shoot high above the chimney. Many a big hot-air balloon has been burned up that way on a windy day, and in our ascensions we have dozens of ropes sewn all over the balloon sides; we call them wind guys, so that men can pull the cloth away from the fire while it 's filling. Say, talking about boys getting spanked, I must tell you a story."

The story was from his own boyish experience—how he made his first trip to the clouds at the age of twelve, and set a whole city talking. This was the city of Cleveland, Ohio, where on a certain Sunday afternoon there was to be a balloon ascension at the great pleasure park. Young Stevens, of course, was present, wild with excitement, for balloons had been in his thoughts and dreams ever since he could remember. He pressed forward through the crowd and, with bulging eyes, watched the aeronaut arrange his barrels and pipes for the hydrogen-making, danced with delight as the great bag swelled and struggled, and finally was bitter in disappointment when the police appeared suddenly with orders to prevent the ascension, because the day was Sunday.

Then, while the balloonist was protesting and pleading, Stevens formed his plan. He would go up himself instead of the man. There was the balloon all ready, held by a single rope. There was the basket swinging impatiently, empty, and he more impatient than the basket. Quickly he turned to a boy who

was with him. "Say, I 'll tell you what. You get a knife and cut that rope, and I 'll go up." But the boy demurred. Anyhow, he had no knife. So away dashed Stevens, and returned in a jiffy with a knife, taken from his father's shop. It was a sharp one.

"There," panted the boy. "Now, cut her quick, soon as I climb in."

The people about were so occupied with the parley growing warm between balloonist and police that few paid attention when a little shaver in knicker-bockers crept close to the basket and then slipped over its side. But the next minute nine thousand people paid considerable attention and shouted their surprise and delight as the eager balloon suddenly shot skyward, a small white face peering down and trying not to look frightened. The knife had done its work, and the subject of dispute, abruptly removed, was presently soaring half a mile above the city, drifting with the wind.

Meantime little Leo, curled up at the bottom of the car, was saying over to himself a story he had read of two little babies who went up once in a balloon and sailed far, far away and never came back, but they might have come back if only they had been strong enough to pull a string that hung over them. Hello! So there was a string to pull! Well, any boy could pull a string. He was n't a baby. But where was the old string? He must look about and find it. And sure enough he did find it, only it turned out to be a stout rope, and he tugged at it valiantly until the valve opened and the balloon began to descend, just as the story-book said it would. And so occupied was Leo with keeping this valve open that he never once looked at the wide view spread beneath him, nor knew where

he was until he came bumping into a treetop, and found himself upset among the branches, which first tore his clothes to tatters and then dropped him into a muddy canal, whence he emerged a sadly battered and bedraggled aëronaut, yet happy. And even when his mother chastised him that evening with a ram-rod (his father being a gun-maker) he remained serene, for had he not gone up in a balloon, and was not the whole of Cleveland admiring him, and would he not go up again (he knew he would, despite all promises made under ram-rod stress) as soon as the chance presented?

And within a year the chance did present, a bait of fifty dollars per ascension being offered the lad, and the outcome was he ran away from home, and saw no more of his family until years had passed and he had grown accustomed to dangers of the air and diamonds of value in his apparel.

“Is n’t it queer,” said Stevens, talking it over, “how a fellow will stay away from his people when everything is all right, and get back to them through trouble? After I started in to be a balloonist I never saw my mother for seven years. Then I came once more to Cleveland to give an exhibition at the very park where I first went up—they call it Forest City Park. I was to perform on a slack wire nine hundred feet long, stretched between two towers one hundred and fifty feet high. My wire was n’t long enough to reach all the way, so they spliced on a length of three hundred feet more, and before I began my feats I walked back and forth over the wire to test it. I always do that. Then I walked to the middle of the wire and pretended to slip and fall—that’s a regular trick to startle the crowd. You let yourself drop suddenly, catch on the wire, and spring up again. Well, this time when I let myself drop I did n’t spring up again,

and I did n't know anything more for nineteen days, when I came to myself in the Huron Street Hospital. Somehow that splice in the wire had broken, and I went straight to the ground, breaking one arm, both wrists, and cracking my spinal column in four places. It 's a wonder I lived at all, they say, and during that hard time my mother came to me, as mothers do. Oh, she does n't love the balloon business, I can tell you.

But I love it. I 've made over a thousand ascensions, and never been badly hurt but once."

We were far away now from our balloon-making, and I reminded Stevens that we had still to tell the boys how to make a parachute.



"All right," said he; "here you are," and he gave me the following directions: "The parachute is made of fourteen segments of tissue paper, each one like this, measuring thirty-six inches long, six inches wide at the base, and tapering like the pattern up to a point. These segments must be pasted together lengthwise, the fourteen points joining at the top of the parachute, and in each one of the fourteen side-seams a length of eighty inches of No. 8 thread must be pasted, leaving two inches sticking out at the top and about four feet hanging down below. The short ends at the top must be tied together, and these made fast to a piece of iron hoop pasted in the mouth of the balloon. Here the fuse must be placed and lighted just as the balloon is ready to start. A five-minute fuse will be long enough, and it must be so placed that when it has burned its time the parachute will fall from the balloon. The long ends below must be tied to a curtain ring, from

which the little basket hangs, with the kitten securely fastened in it by a piece of cloth pierced with four holes for the four legs. This can be brought up over the kitten's back and tied to the sides of the basket. In this way the kitten is in neither danger nor discomfort. The boys must be careful to make this plain to mothers and sisters, or their experiments may be stopped by family orders. I 'll guarantee one thing, though, if they carry out these instructions carefully, your boy friends will have a fine time."

I certainly hope they will.

THE PILOT

I

SOME STIRRING TALES OF THE SEA HEARD AT
THE PILOTS' CLUB

OF all the clubs in New York, I know none where a man who values the real things of life may spend a pleasanter hour than at the Pilots' Club, far down on the lower water-front, looking out of lofty windows in one of those great structures that make the city, seen from the bay, a place of wonderful fairy towers.

Here on the walls are pictures that call up thrilling scenes, as this painting of pilot-boat No. 11 (they call her *The Phantom*), rescuing passengers from the *Oregon*, helpless in the great storm of 1886, sixty miles beyond Sandy Hook. We shall find men sitting about these rooms, smoking and reading, who can tell the story of that night in simple, rugged words that will make the water devils dance before us.

Look at them! These are the pilots of New York, greatest seaport in the world, with its tidy annual total of twenty-odd millions in tonnage entered and cleared, against fifteen millions for London. These are the boys (some of them nearing seventy) who bring the mighty liners in and take them out, who fight through any sea at a vessel's blue-light bidding, and climb her fortress sides by a slamming whip-lash ladder that shames the flying trapeze. And this in trim derby hat

(sometimes a topper), with gloves and smart necktie, and some New-York "Heralds" tucked away in a coat-tail pocket.

Look at them! These are the boys who stay out when every other floating thing comes in, who face an Arctic rigor when masts are barrel big with ice, and ropes like trees, and when climbing to a steamer's deck is like skating up an iceberg. These are the boys who know, through fog and darkness, the call of the whistling buoy that sings at the mouth of Gedney's, and can say "Good morning" to every bobbing juniper-spar that marks the long ship lane (red lights on starboard buoys, as you come in, white lights on port buoys), who know the way even when the glass and iron lamp-frames are all but sunk with ice—west-northwest and a quarter west for a mile and a half, till the beacon lights of Waackaack and Point Comfort line out straight on the Jersey shore, then west by south until the Sandy Hook light lines with the old South Beacon, then a short way northwest by west and a quarter west until the Conover Beacon lines with Chapel Hill, and so on straight to the Narrows.

These are the boys who know every rock and shoal in this most treacherous bay, with its thirteen lighthouses, its two light-ships, and its eighty danger spots, marked by nun-buoys, bell-buoys, electric-light buoys, whistling buoys, all familiar to them as their own homes.

Great boys they are for story-telling, these pilots, and by the hour I have listened to their memories of the sea. Two things made deep impression on me (so do we of less heroic lives take note of weakness in the strong)—one, that many pilots cannot swim (the same is true of deep-sea divers), the other, that pilots, even after years at sea, may be victims of seasickness



THE RESCUE OF THE OREGON'S PASSENGERS.

like any novice. Pilot Breed, for instance, as trusty a man as stands at a liner's wheel, assured me that every time he goes out for duty he goes out for torture, too. And he does his duty and he bears the torture, so that after all we must count this rather strength than weakness.

"How can you do your work," I asked, "if you are in such distress?"

"Because I have to," he answered, with a wistful smile. "You know sailors are often seasick, but they go aloft just the same and work—because they have to. You could do it yourself if you had to. And yet," he added, half shutting his eyes, "I 've many a time been so bad when we 've tossed and tossed for days and nights on the watch for vessels that I 've come pretty near to dropping quietly overboard and ending it."

This he said without any special emphasis, yet one could see that it was true.

"Why don't you give up the life?" I suggested.

"Perhaps I would," said he, "if I could do as well at anything else. Besides—"

Then came the queerest reason. His father, it seems, a pilot before him, had suffered from seasickness for thirty-seven years, and then for thirty years more had been quite free from it. "Now," said Breed, "I 've been a pilot for twenty-two years, so I figure if I stick to it fifteen years more I may be like my father after that, and have no more trouble."

Think of that for a scheme of life!

Presently another pilot joined us, and set forth a remarkable experience. "I was taking the steamer *Lahn* once," said he, "through a heavy fog, and the captain and I were both on the bridge, anxious to locate the light-ship. You know she lies eight miles off the Hook, and gives incoming vessels their first bearings for the channel. Of course we did n't expect to see her light—you could n't see anything in such weather—but we listened for her fog-horn. How we did listen! And presently we heard it. You get accustomed to judging distances over water, by the sound,

and I put that light-ship at five miles away, or thereabouts, and I was n't far wrong. Well, we headed straight for it, and heard the fog-horn all the time for about a mile. Then it suddenly stopped.

“‘Hullo!’ said I. ‘What’s up?’

“‘Confound those light-ship people,’ growled the captain. ‘I’ll make complaint against them for stopping their horn.’

“‘Wait a little,’ said I, and kept listening, listening for the horn to blow again, and all the time we were running nearer to the shoal. Pretty soon we slowed down, and went on a couple of miles, then another mile. It seemed as if we must have reached the light-ship, and the captain was in a state of mind.

“Then suddenly the fog-horn sounded again, not four lengths away, sir, and the queer thing is it had been sounding the whole blamed time—we got positive proof of it afterward—only we had n’t heard it. The explanation was that we had passed through two sound zones—that’s what the scientific people call ‘em—and I can tell you those sound zones make considerable trouble for pilots.”

To this perplexing statement the others nodded grave assent, and Breed capped the tale with a sound-zone story of his own. It was just off quarantine, and he was turning a liner to bring her up to dock when another liner came along, also running in. Breed gave the signal three times for the other liner to port her helm, and she signaled back three times for him to port his. By good luck each vessel did the right thing, and they passed safely, but neither pilot heard the whistle of the other, and each made angry complaint that the other had failed to whistle; yet witnesses testified that both had whistled, and each one swore that he had.

The truth was, according to the gentlemen who explain acoustic puzzles, that these two steamers happened to be placed there down the bay like two people in a whispering gallery, who cannot hear each other where they are, but would hear plainly if they moved further apart or drew closer together, so as to be in the foci of sound. Thus it was that distant vessels heard both sets of whistles, although there was a nearer region where these were inaudible.

Investigation has shown that these sound zones frequently establish themselves at sea (they vary in extent with wind and tide), so that the sound of horn or bell may be heard for a mile or two, and then become inaudible for, say, two miles, and then become audible again, almost as plainly as at first, for several miles more. The theory is that the sound-waves somehow go skipping over the sea, like a flat pebble over a mill-pond, in long jumps, and that a vessel under the highest part of one of these jumps is out of the sound influence, but will come into it again by going ahead a certain distance or going back a certain distance. Whether this explanation be the true one or not, the facts are abundantly vouched for, and are believed to explain various collisions and wrecks that have long been looked upon as mysteries.

“There are lots of queer things about our business,” reflected an old pilot. “Now, you take steamers, they ’re just as different as people; each one has her own ways, and most likely her own partic’lar kind of crankiness. They talk about twin steamers, but there ’s no such thing. You can have ’em both made in the same yard, with every measurement alike, and they ’ll be as different, sir, as—as two violins. Why, I never saw a craft that ’d sail the same on both tacks; they ’re always harder on one than the other. And as

for compasses—well, I don't suppose there's ever two that came into this port with needles pointing just the same way. They all lean a shade one way or the other, same as watches."

"Lean a shade!" put in another man. "I've known 'em to lean a whole lot. I've known a steamer's compass to point plumb northeast instead of north. And that time we nearly went on the rocks by it. We were coming along past Fire Island, and the night was pretty thick. I felt something was queer and would n't go below, although the captain wanted me to. I kept looking up, looking up, searching for the north star, and pretty soon I made it out, or thought I did, through a rift in the blackness.

"Hold on!" said I to the captain, 'something's the matter with your compass. There's the north star ahead of us, and it ought to be abaft the bridge.'

"North star nothing," said the captain. "You're tired, man; you need a rest. Now, you just turn in for an hour, and I'll run her."

"You'll run her on the rocks," said I, 'inside of fifteen minutes unless you pull her out of here. I tell you that compass is crazy.'

"Well, sir, he began to get scared when he saw me so positive, and a little later he pulled her out—just in time, too, for we were right on the breakers of Long Island, thanks to that lying compass. I've heard it's the magnetic sand at Shinnecock that devils compasses. You know there's acres and acres of it along there."

This led to a discussion of magnetic sand, and it was edifying to see how well informed these pilots are in the latest advances of science.

They set forth, for example, the clear advantage of literally pouring oil upon furious waters, and were all agreed that the foam of a spent wave, spreading around

a life-boat, will often protect her against a succeeding wave. The foam seems to act like oil in preventing a driving wind from tossing up the surface—getting a hold on it, one might say.

“Taking it altogether,” I asked, “do you men regard a pilot’s life as very dangerous?”

It was Breed who answered: “Taking it altogether,” said he, “I regard a pilot’s life as about the most dangerous going. Here’s a little thing to show you how fast they go, these lives of pilots. When I was received as apprentice there were eighteen other apprentices ahead of me, and the only way we could get to be pilots was through somebody dropping out, for there were never more than just so many licenses issued. Well, when I had been an apprentice for three years the whole eighteen had been received as pilots, and there were seven vacancies besides. That makes twenty-five dead pilots in three years, and most of ‘em killed. Why, in the blizzard of 1888 alone ten of our boats were wrecked.”

At this there was a solemn shaking of heads, then stories of the taking off of this or that gallant fellow. There was Van Pelt, one of the strongest men in the service—a pilot from a family of pilots—killed by the stroke of a tow-line—a big hawser that snapped across his body like a knife when the towing-bitts pulled out, and cut him clean in two.

Then there was that Norwegian apprentice, who was lost when they tried to send a small boat after Denny Reardon on the *Massachusetts*, in the storm of November, 1897. The *Massachusetts* was loaded with lions, tigers, and elephants—the whole Barnum & Bailey show—and Reardon had just got her safely over the bar. There was a fierce sea on that night, and Reardon waited at the steamer’s side—waited and

peered out at the flare-up light, while the boys on the *New York* tried to do the launching trick. And in one of the upsets this Norwegian chap was swept astern and churned to death in the screw-blades.



A PILOT-BOAT RIDING OUT A STORM.

Then there was Harry Devere, a Brooklyn pilot, who happened to be out in the cyclone of 1894, miles from land, in the little pilot-schooner, with its jaunty "17" on the canvas. There they were, riding out the storm, as pilot-boats do (facing it, not running), when up loomed a big West Indian fruiter, burning a blue

light forward, which meant she was in sore need of a man at the wheel who knew the dangers in these parts. The old ocean was killing mad that night, air and water straining in a death struggle, and already four pilots had been carried on by liners, carried on to Europe because there was no human way of putting them off.

To start for that vessel now was madness, and every man in the pilot-crew knew it, and so did Devere. But he started just the same. He said he would try, and he did—tried through a cyclone that was sweeping a whole heaven of snow down upon the bellowing sea as if to smother its fury. Down into this they went, three of them, and somehow, by a miracle of skill, got the yawl under the vessel's lea. Then smash they were hurled against the iron side, and Devere sprang for the rope ladder—a poor, fluttering thing. He caught it, held fast, and the next moment was torn away by a great wave that cast him back into the waste of waters. And so he perished.

You ought to hear them tell these stories!

On the whole it seemed clear there is danger enough in this calling for the most extravagant taste. And the chief danger is not this boarding of vessels in storms, nor yet the dancing out of tempests in cockleshell craft, where a steamer would scurry to shelter; neither of these, but the everlasting peril of being run down. That is a danger to break men's nerves, for always, night and day, the pilot-boats must lie in the swift track of the liners—right in the track, else they will pass unseen—and it must be known that this is a narrow track, a funnel for the ships of all the world, which pass ceaselessly, ceaselessly, converging from all ports, diverging to all ports, in storm, in fog, in darkness, and there the pilot-boats must lie, flying their square blue flags by day, burning their flare-up lights

every fifteen minutes by night, waiting, waiting, in just such strained suspense as a man would feel before the rush of a silent locomotive, sure to kill him if he does not see it, before the rush of many silent locomotives which come while he sleeps, while he eats, perhaps while he prays.

And constantly in the pilot records is this laconic entry: "No. 8 run over and sunk; all hands lost." "No. 11 run over and sunk; one man saved, the rest lost." "Pilot-boat *Columbia* cut down by a liner; ten men lost." No chance for heroic struggle here, no death with dramatic setting and columns in the papers, but a stupid, blundering execution while the men rest helpless on weary bunks, lulled by the surging sea—"run over and sunk."

II

WHICH SHOWS HOW PILOTS ON THE ST. LAWRENCE FIGHT THE ICE-FLOES

NO study of pilot life can be complete without mention of the river pilot who has to face perils in the rapids not a whit less real than those faced by his brother pilot on the sea. I got my first glimpse of the river pilot, oddly enough, in frozen December time, when even that great waterway of northern America—I mean the St. Lawrence—was all but a solid bed of ice, not quite, however, and to that chance I owed a glimpse of Canadian boatmen at the hazard of their winter work, which is none the less interesting for being unfamiliar.

It was fifteen degrees below zero, just pleasant Christmas weather in Quebec, and the old river of saintly fame was grinding along with its gorge of ice, streaming along under a dazzle of sun, steaming up little clouds of frozen water-vapor, low-hanging and spreading over it like tumbled fleece in patches of shine and shadow, quite a balloon effect, I fancied, as I came down the cliff.

In a tug-boat office at the river's edge, chatting around a stove, yet bundled thickly as if no stove were there, I found some half dozen sharp-glancing men, who might have been actors in New York or noblemen in Russia (I judge by the fineness of their furs), but were pilots here, lower-river pilots who, as one of

them assured me, are vastly more important than the upper-river kind.

I learned also from one who wore a coat of yellowish-gray skins with otter trimmings that they were a belated company, who would start shortly for Orleans Island across the ice. That was Orleans Island there to the left. No, it did not seem far, but I might find it far enough if I tried to get there. At this they all laughed.

Meekly I sat down, as was befitting, and listened to the talk. They conversed in bad French or worse English, and were most of them, strange to say, Scotchmen who had never seen Scotland and never would—Douglases and Browns and McGregors, who could n't pronounce their own names, but could take a liner to the gulf, day or night, through the reefs of Crane Island, past the menacing twin Pilgrims, by windings and dangers, safe down to sea.

I asked the man what they were going to Orleans Island for, and he explained that they lived there through the winter months—they and other pilots, many others. It was a pilot colony, set out in mid-stream. Yes, it was cut off from the land, quite cut off; they liked it so. Sometimes they did n't come ashore for weeks; it was not exactly fun fighting those ice-floes. And they all laughed again; well, not exactly!

Meantime several jolly little cutters, no higher than cradles, had jingled up with more men in furs and one woman. Also boxes and bundles.

“Pilots?” I asked.

The man nodded.

“And the woman?”

“Dees lady, pilot's wife. She 'been seek.” And he went on in a jargon that is charming, but not for imi-

tation, to explain that they would lay the sick lady in the bottom of the boat and pile coats over her and around her until it was tolerably sure she could n't freeze. From the way he spoke one would fancy they were about to start for the North Pole, but I presently understood that this two-mile ice journey over the crackling St. Lawrence—the crackling comes from the ice-crust breaking as the tide drops under it—is about as hard a test of men's endurance as any Arctic performance.

They were all gathered now save one, whose cutter tarried still. He was a good pilot, but overfond of the convivial glass, and was no doubt this very moment in some uproarious company, forgetful that the start was to be sharp on the hour. Well, they would give him ten minutes more, say fifteen minutes, *pauvre garçon*.

Then they fell to discussing winter navigation, and whether it would ever come on the St. Lawrence as it had on rivers in Russia. A pilot in coon-skins was sure it would come; they would put on one of these new-fangled ice-crunching steamers to keep the main channel open, and, *sacré bleu*, there you are! That would save five months every year. But the others shook their heads; they did n't believe it, and did n't want it anyway. A pilot, sir, must have a certain time to smoke his pipe!

Then one man told what the ice did to a sailing-vessel he was taking down the river late one season. He hoped never to take another down so late. He had got out of his course one night in the dangerous ways off Crane Island, and finally dropped anchor to hold her against the crush of ice. But the anchor chain snapped like shoe-string under the ice pressure, and they were borne along on a glacier-field until they struck on a reef—just what he had feared. Now, the

ice could neither break the reef nor drive them over it, but it ground its way right through the schooner's stern, ripping her wide open, so that the river poured in, and down they went until the yard-arms touched the hummocks, with pilot and crew left to scramble over the floe as best they could in the darkness, and wait for daylight on the frozen rocks.

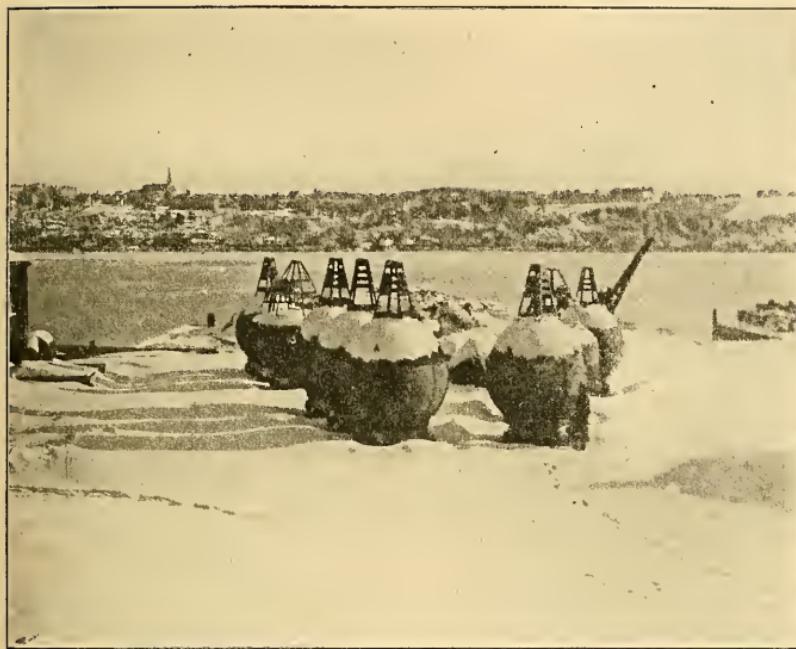
At this the others, taking up the cue of thrilling happenings, told stories of dangers on the river one after another until the tardy pilot, who had jingled up meanwhile unnoticed, was in his turn forced to wait for them.

"I was just putting off one night," began a tall man, who spoke better English than the rest, "just putting off from this very place—"

"Thash nothing," interrupted the later comer, "I shaw sh-sword fish clashe a wh-whale once off Saguenay River, an wh-whale—an sh-sword fish—" then he mumbled to himself and dozed by the stove.

The tall man went on with his tale, which described how, on the night in question, he was about to board a down-coming steamer of the Leyland line (he was to take the place of the Montreal pilot), when she crashed into a tramp steamer coming up in a head-on collision, and two sailors sleeping in their bunks were instantly killed. He described the panic that ensued, and told what they did, and wound up with a queer theory (which he declared perfectly sound, and the others agreed with him) that the growth of cities along the river is every year increasing the danger of such night collisions through the dazzle of lights.

Presently we started for the boats. A burly line, with caps reaching down, and collars reaching up, until everything was covered—ears, forehead, chin, everything but a peeping place for nose and eyes. I



RIVER-BUOYS ON THE BANK FOR THE WINTER.

can still hear the squeak and crunch of snow under foot, and see the glare of it. We passed a snow-field, where the river-buoys are left through winter, spar-buoys, gas-buoys, and bell-buoys ranged along now like great red tops numbed by the cold to sleep.

Then they put off in the boats—three open boats—that are sleds as well, with runners on the flat bottoms and ends turned up in an easy slant, so that when the broken ice gets too thick for paddling they may be hauled up to slide over it. This queer method of transit is practised on the St. Lawrence, by those who dare, during certain weeks of winter when the river is no longer open nor yet frozen into a solid ice-bridge, but partly open and partly solid. So it was now.

The first rule of the boats is that every man lay hand

to paddle and work. There are no passengers here but the sick, and they are rarely taken. Not that the pilots would mind paddling other men across, but the other men would almost certainly freeze if they sat still. There is no safety against the blasts that sweep this river, when the glass says twenty below, but in vigorous, ceaseless exertion.

So there they go through the ice-choked river, swinging their paddles lustily, every pilot of them, heads nodding under black astrakhan caps, shoulders heaving, off for home. Now they strike the first solid place, and the men forward climb out carefully and heave up the boat's nose a couple of feet to see if the ice will hold her. Then all climb out, and with dragging and pushing get ahead for a hundred feet or so. See, now they stop and swing their arms! Already the pitiless wind is biting through their furs. And think of that poor woman!

Presently they reach an open spot some dozen yards across, and all but one take places in the boat, the stern man standing behind on the ice to push off, and then, with nicely judged effort, spring aboard as he gives the last impulse that shoots her into the river.

From the open space they paddle into a jam of grinding ice-blocks that hold hard against them, but are scarce solid enough to bear the sledges. They must work through somehow, poling and fending, to yonder heaped-up ledge, where up they go again on a great rough raft of ice that will test their muscles and their skill before they get across, and drift them a quarter of a mile or so up-stream while they are doing it.

Up-stream, did I say? Yes, for there is this odd thing about the St. Lawrence, even at Quebec, that its current streams up and down, up and down, as the tide changes. For seven hours the river conquers the tide,

and the water runs down to sea. Then for five hours the tide conquers the river, and the water runs up from the sea. So now, after all their toiling, they are actually further from home than when they started. They should have set out just before the turn of tide (that was their plan), but they waited until just after the turn, and will pay for the delay and their yarn spinning with an hour more of this ice-fighting than they need have had—and an hour out there is a long, long time.

Even here, on the bank, much less than an hour is enough of time. The cold grows piercing. The day is drawing to a close. The sky is dull. The river grinds on with its grayish burden. On the heights of Levis, opposite, some lights of early evening break out. There also pilots live, Indians come from an Indian village down the river, where they make the peerless birch canoes. All along this grand St. Lawrence live men whose business it is to face unusual perils, whose nerve fails them not, whether paddling some frail bark through furious rapids or guiding a steamboat down a raging torrent, with many lives in their keeping.

We must see more of these men, and watch them at their work. We must see the Iroquois pilots at their reservation near Montreal, the lads Lord Wolseley took with him up the Nile to brave its cataracts, when the English set out, in 1884, to bring relief to Gordon. We must see "Big John," famous now for years as wheelsman of the great excursion boats that shoot the rage of waters at Lachine. We must see the raftsmen, too, and—ah, but it is cold here!—let us climb the cliff again and find some shelter.

III

NOW WE WATCH THE MEN WHO SHOOT THE FURIOUS RAPIDS AT LACHINE

WOULD you see the most skilful pilots in the world, men who know all the tricks with ocean liners and the Indian tricks as well, who fight the rush of seventy-foot tides in the Bay of Fundy, or drive their frail canoes through furious gorges, or coolly turn the nose of a thousand-ton steamboat into the white jaws of rock-split rapids where a yard either way or a second's doubt would mean destruction, or hitch long hawsers to a log raft big as a city block (the lumber in a single raft may be worth a hundred thousand dollars), and swing her down a tumbling water-way hundreds of miles, with a peril in every one, and land her safe? If you would see all this, go to the wonderful St. Lawrence, which sweeps in wide and troubled reaches from the Great Lakes to the sea.

Of course I do not mean that any one man can do all these things,—that would be asking too much,—but each in his own line, half-breed or Indian or furbundled voyageur, has such quickness of eye, such surety of hand, that you will be glad to watch the rafters on their rafts, and ask no more of them, or the canoeists at their paddles, or the big-craft pilots at their wheels.

Let us stand on the long iron bridge that spans the St. Lawrence just above Montreal, the very place to

study the river as it narrows and runs swifter for its smashing plunge through yonder rapids to the east, the dreaded Lachine Rapids, whose snarling teeth flash white in the sun. Look down into the greenish rush, and see how the waters hurl past these good stone piers, sharp-pointed up-stream against the tearing of winter ice! Here goes the torrent of Niagara and the inland ocean of Superior and Erie and Ontario, all crushed into a funnel of land by this big island at the left that blocks the flow, and gorged by the in-pour of the Ottawa a few miles back that brings down the floods of southern Canada. As fast as a horse can gallop runs the river here, and faster and faster it goes as the long slant takes it, ten, twelve, fourteen miles an hour (which is something for a river), until a dozen islands strewn across the funnel's lower end goad the rapids to their greatest rage. Here is where they kill. Then suddenly all is quiet, and the river, spreading to a triple width, rests, after its madness, in Montreal's placid harbor.

Standing here, I think of my first experience in shooting these rapids (it was on one of the large river boats), and I must confess that it gave me no very thrilling sense of danger. There were two or three plunges, to be sure, at the steepest part, and a little swaying or lurching, but, so far as movement goes, nothing to disturb one accustomed to the vicissitudes of, say, ordinary trolley-car navigation. However, when I came to the reason of this fairly smooth descent, and saw what it means to stand at the wheel through that treacherous channel, I found my wonder growing. I thought of the lion-tamer, whose skill is shown not so much by what happens while he is in the cage as by what does not happen. A hundred ways there are of doing the wrong thing with one of

these boats, and only a single way of doing the right thing. For four miles the pilot must race along a squirming, twisting, plunging thread of water, that leaps ahead like a greyhound, and changes its crookedness somewhat from day to day with wind and tide. In that thread alone is safety; elsewhere is ruin and



"BIG JOHN" STEERING A BOAT THROUGH THE LACHINE RAPIDS.

wreck. Instantly he must read the message of a boiling eddy or the menace of a beckoning reef, and take it this way or that instantly, for there are the hungry rocks on either hand. He must know things without seeing them; must feel the pulse of the rapids, as it were, so that when a mist clouds his view, or the shine of a low-hung rainbow dazzles him, he may still go right. It is a fact that with all the pilots in this pilot-land, and all the hardy watermen born and brought up on the St. Lawrence, there are not ten—perhaps not six—men in Canada to-day, French or English or Indian, who would dare this peril. For all

other rapids of the route, the Gallop Rapids, the Split-rock Rapids, the Cascades, and the rest, there are pilots in plenty; but not for those of Lachine. And, to use the same simile again, I saw that the shooting of these Lachine Rapids is like the taming of a particularly fierce lion; it is a business by itself that few men care to undertake.

So it came that I sought out one of these few, Fred Ouillette, pilot and son of a pilot, an idol in the company's eyes, a hero to the boys of Montreal, a figure to be stared at always by anxious passengers as he peers through the window atop the forward deck, a man whom people point to as he passes: "There 's the fellow that took us through the rapids. That 's Ouillette." This unsought notoriety has made him shy. He does not like to talk about his work or tell you how it feels to do this thing. A dash of Indian blood is in him, with some of the silent, stoic, Indian nature. Yet certain facts he vouchsafed, when I went to his home, that help one to an understanding of the pilot's life.

He emphasized this, for instance, as essential in a man who would face that fury of waters, he must not be afraid. One would say that the rapids feel where the mastery is, whether with them or with the pilot, and woe to him if pounding heart or wavering hand betray him. The rapids will have no mercy. And there are pilots, it appears, who know the Lachine Rapids, every foot of them, and could do Ouillette's work perfectly if Ouillette were standing near, yet would fail utterly if left alone. Every danger they can overcome but the one that lies in themselves. They cannot brave their own fear. He cited the case of a pilot's son who had worked in the Lachine Rapids for years, helping his father, and learned the river as well as a man can

know it. At the old man's death, this son announced that he would take his father's place, and shoot the rapids as they always had done; yet a season passed, then a second season, and always he postponed beginning, and, with one excuse or another, took his boats through the Lachine Canal, a safe but tame short cut, not likely to draw tourists.

"Not start heem right, that fadder," said Ouillette. "Now too late. Now nevair he can learn heem right."

"Why, how should he have started him?" I asked.

"Same way like my fadder start me." And then, in his jerky Canadian speech, he explained how this was.

Ouillette went back to his own young manhood, to the years when he, too, stood by his father's side and watched him take the big boats down. What a picture he drew in his queer, rugged phrases! I could see the old pilot braced at the six-foot whieel, with three men in oilskins standing by to help him put her over, Fred one of the three. And it was "Hip!" "Bas!" "Hip!" "Bas!" ("Up!" "Down!" "Up!" "Down!") until the increasing roar of the cataract drowned all words, and then it was a jerk of shoulders or head, this way or that, while the men strained at the spokes. Never once was the wheel at rest after they entered the rapids, but spinning, spinning always, while the boat shot like a snake through black rocks and churning chasms.

They used to take the boats—as Ouillette takes them still—at Cornwall, sixty miles up the river, and, before coming to Lachine, they would shoot the swift Coteau Rapids, where many a life has gone, then the terrifying Cedar Rapids, which seem the most dangerous of all, and finally, the Split-rock Rapids, which some say are the most dangerous. And each year, as the



FRED OUILLETTE, THE YOUNG PILOT.

season opened, Fred would ask his father to let him take the wheel some day when the river was high and the rocks well covered, and the boat lightly laden, wishing thus to try the easiest rapids under easiest conditions. But his father would look at him and say: "Do you know the river, my son? Are you sure you know the river?" And Fred would answer: "Father, I think I do." For how could he be sure until he had stood the test?

So it went on from year to year, and Ouillette was almost despairing of a chance to show himself worthy of his father's teaching, when, suddenly, the chance came in a way never to be forgotten. It was late in the summer, and the rapids, being low, were at their very worst, since the rocks were nearer the surface. Besides that, on this particular day they were carrying a heavy load, and the wind was southeast, blowing hard—the very wind to make trouble at the bad places. They had shot through all the rapids but the last, and were well below the Lachine bridge when the elder Ouillette asked the boy, "My son, do you know the river?"

And Fred answered as usual, without any thought of what was coming next, "Father, I think I do."

They were just at the danger-point now, and all the straining waters were sucking them down to the first plunge.

"Then take her through," said the old man, stepping back; "there is the wheel."

"My fadder he make terreeble thing for me—too much terreeble thing," said Ouillette, shaking his head at the memory.

But he took her through somehow, half blinded by the swirl of water and the shock. At the wheel he stood, and with a touch of his father's hand now and

then to help him, he brought the boat down safely. There was a kind of Spartan philosophy in the old man's action. His idea was that, could he once make his son face the worst of this business and come out unharmed, then never would the boy know fear again, for all the rest would be easier than what he had already done. And certainly his plan worked well, for Fred Ouillette has been fearless in the rapids ever since.

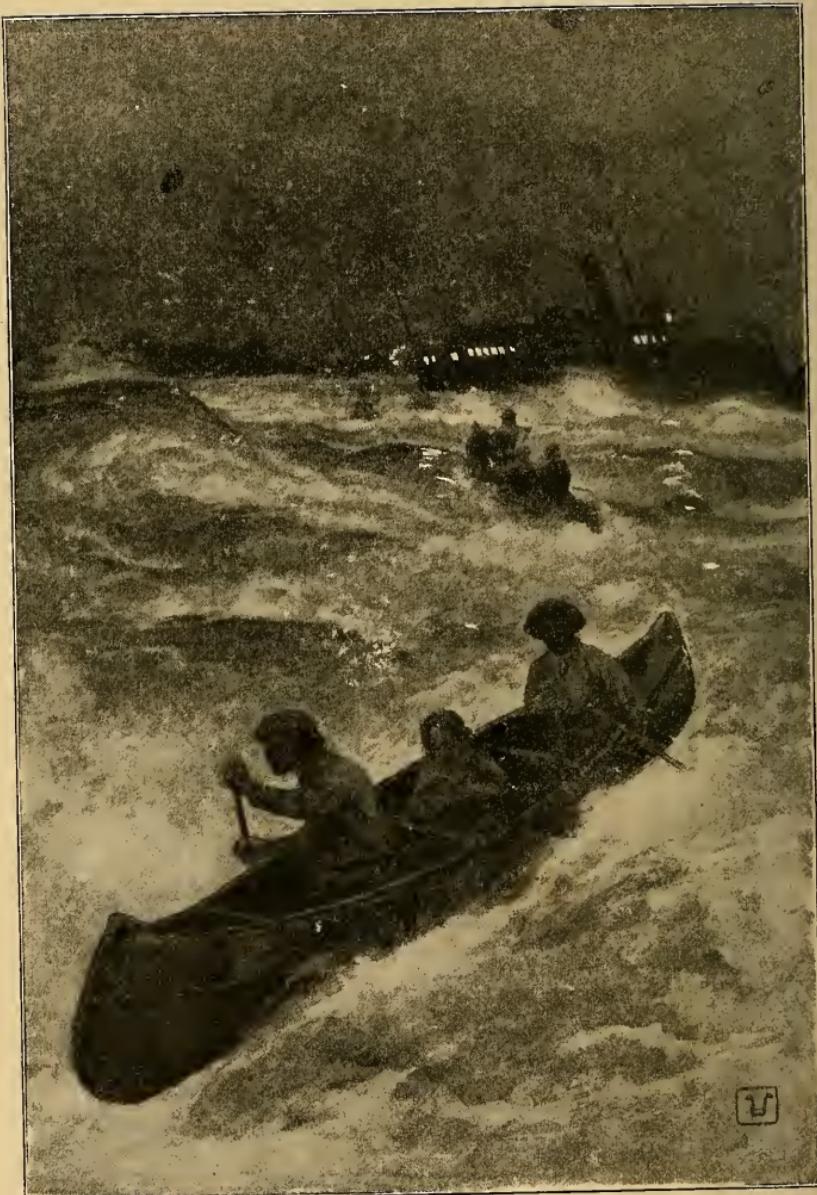
"Have you lost any lives?" I asked, reaching out for thrilling stories.

"Nevair," said he.

"Ever come near it?"

He looked at me a moment, and then said quietly: "Always, sair, we come near it."

Then he told of cases where at the last moment he had seen some mad risk in going down, and had turned his steamer in the very throat of the torrent, and, with groaning wheels and straining timbers, fought his way back foot by foot to safety. Once a fog dropped about them suddenly, and once the starboard rudder-chain broke. This last was all but a disaster, for they were down so far that the river must surely have conquered the engines had they tried to head up-stream. Ouillette saw there was only one way to save his boat and the lives she carried, and, putting the wheel hard apart, for the port chain held, he ran her on the rocks. And there she lay, the good steamboat *Spartan*, all that night, with passengers in an anguish of excitement, while Indian pilots from Caughnawaga made it quite clear what *they* were good for—put off swiftly in their little barks straight into that reeling flood, straight out to the helpless boat, then back to shore, each bearing two or three of the fear-struck company. Then out again and back again until darkness came. Then out again and back again when darkness had fallen.



THE INDIAN PILOTS RESCUE PASSENGERS FROM THE STEAMER ON THE ROCKS.

Think of that! Hour after hour, with paddles alone, these dauntless sons of Iroquois braves fought the rapids, triumphed over the rapids, and brought to land through the night and the rage of waters every soul on that imperiled vessel!

Another instance he gave, showing the admirable alertness of these Indians, as well as their skill with the canoe. It was in the summer of 1900, late of an afternoon, and so heavy was the August heat that even on the river the passengers were gasping for air. Shortly after they entered the cataract several persons saw a large man climb to the top of a water-tank on the hurricane-deck, and seat himself there in one of the folding deck-chairs. The man's purpose was, evidently, to seek a cooler spot than he had found below, and the boat was running so steadily that no one thought of danger. Indeed, there would have been no danger had not the gentleman fallen into a comfortable doze just as Ouillette steadied the boat for her first downward leap and then brought her over to starboard with a jerk, which jerk so effectually disturbed the large man's slumbers that the first thing he knew he was shot off his rickety chair, over the side of the water-tank, clean over the steamboat's decks, down, splash! into the St. Lawrence at a point where it is not good for any man to be. He was right in the main sweep of the river, where one may live for twenty minutes if he can keep afloat so long, but scarcely longer, since twenty minutes will bring him to the last rush of rapids, where swimmers do not live.

What happened after this I have from an eye-witness, who rushed back with others at the cry, "Man overboard!" and joined in a reckless throwing over of chairs, boxes, and life-preservers that profited little, for the man was left far behind by the steamboat, which



"MAN OVERBOARD!" AN INDIAN CANOE TO THE RESCUE.

could do nothing—and Ouillette could do nothing—but whistle a hoarse danger-warning and go its way. A magnificent swimmer he must have been, this rudely awakened tourist, for the passengers, crowded astern, could follow the black speck that was his head bobbing along steadily, undisturbed, one would say, by dangers, apparently going up-stream as the steamboat gained on him—really coming down-stream with the full force of the current, and yielding to it entirely, all strength saved for steering. Not a man on the boat believed that the swimmer would come out alive, and, helpless to save, they stood there in sickening fascination, watching him sweep down to his death.

Then suddenly rang out a cry: "Look! There! A canoe!" And out from the shadows and shallows offshore shot a slender prow with a figure in bow and stern. The Indians were coming to the rescue! They must have started even as the man fell,—such a thing it is to be an Indian!—and, with a knowledge of the rapids that is theirs alone, they had aimed the swift craft in a long slant that would let them overtake the swimmer just here, at this very place where now they were about to overtake him, at this very place where presently they did overtake him and draw him up, all but exhausted, from as close to the brink of the Great Rapids as ever he will get until he passes over them. Then they paddled back.

IV

WHAT CANADIAN PILOTS DID IN THE CATA- RACTS OF THE NILE

AND now suppose we follow these Indians to their reservation at Caughnawaga, where the government has given them land and civic rights and encouragement to peaceful ways. The surest time of year to find the pilots at home is the winter season; for then, with navigation frozen up, they have weeks to spend drifting along in the sleepy village life, waiting for the spring. There, in many a hearth-fire circle,—only, alas! the hearth is a commonplace shiny stove more often than not,—we may listen to tales without end of rapids and river, while the men smoke solemnly, and the women do beadwork and moccasins for the next year's peddling. We may hear "Big Baptiste" tell for what exploits of the paddle his head came to be on the ten-dollar bills of Canada, set in dignity and feathers; and hear "Big John," famous for years as a steamboat pilot, describe his annual shooting of the Lachine Rapids at the opening of navigation, when, first of all the pilots, he goes down in his canoe,—this is a time-honored custom,—so that the others may be sure that it is safe to follow.

He will give us the story, too, amid nods of approval, of shooting these same rapids for a wager on a certain New Year's Day, and coming down safely, ice and all. There, sir, is the paddle he used, if you doubt the tale, and the canoe lies out in the snow.

And be sure we shall not have been long in Caughnawaga without hearing of the proud part these Indians took in the British expedition up the Nile in 1884 to relieve Khartum. Treasured in more than one household are these words of Lord Wolseley, written to the governor-general of Canada: "I desire to place on record not only my own opinion, but that of every officer connected with the management of the boat columns, that the services of these voyageurs has been of the greatest possible value. . . . They have on many occasions shown not only great skill but also great courage in navigating their boats through difficult and dangerous waters."

"How many men did Caughnawaga send on this expedition?" I inquired.

"Fifty-five men besides Louis Jackson," said one of the Indians.

"Oh," said I; "and—and who is Louis Jackson?"

The Indian's face showed plain disgust that there should be any one who did not know all about Louis Jackson.

"Louis Jackson was the leader. He is our chief man. He lives over there."

It resulted in my calling on Mr. Jackson, a big, powerful man, fully meriting, I should say, the high opinion in which he is held. If there is any Indian strain in him it must be very slight; he would pass, rather, for an uncommonly energetic Englishman, with such a fund of adventure to his credit, and so entertaining a way of drawing upon it, that one would listen for hours while he talks.

Jackson made clear to me what important duty was given the Canadian voyageurs in this Nile campaign. By their success or failure in taking heavy-laden boats up the cataracts Lord Wolseley proposed to decide

whether the troops for Gordon's relief should go straight up the Nile or around by the Red Sea and the desert. It was the river if they succeeded; it was the desert if they failed: and twenty thousand

soldiers waited at Alexandria in a fever of impatience while Jackson and his band, with some hundreds of voyageurs from other provinces, let it be seen if their training on the St. Lawrence would serve against river perils in ancient Egypt. Lord Wolseley was confident it would, for during the Riel rebellion he had found out what stuff was in these men. Still he dared not start his



THE PILOT, "BIG JOHN."

army until it was certain those formidable cataracts could be surmounted. And that meant a month, let the men strain as they might at paddles and hauling-lines—a month to wait, a month for Gordon to wait.

"Oh," said Jackson, gloomily, "if Lord Wolseley had only trusted us without any trial! Why, there was nothing, sir, in that Nile River we had n't tackled

a hundred times as boys right here in the St. Lawrence. When you talk of cataracts it sounds big, but we 've got rapids all around here, just plain every-day rapids, that will make their cataracts look sick. Of course we did it—did it easy; but when we got up to the top of the whole business, where was our army? Back in Alexandria, sir! And it makes a man sad to know that those boys in Khartum were dying just then; it makes a man mighty sad to know that!"

One sees what ground there may be for such lament on turning up the dates of this unhappy Nile expedition, and the heart aches at the sight of those dumb figures. Think of it! the relief-party reached Khartum about February 1, 1885—*too late by less than a week*. Khartum had fallen; Khartum, sore-stricken, lay in fresh-smoking ruins. And when at last British gunboats, firing as they came, steamed into view of the tortured city that had hoped for them so long, there was no General Gordon within walls to thrill with joy. General Gordon was dead, cut down ruthlessly by the Arabs *a few days before*—killed on January 27, with his countrymen so near, so short a distance down the river, that their camp might almost have been made out with field-glasses. What a difference here a little more hurrying would have made, a very little more hurrying!

It would be interesting indeed if we might hear the whole story of these months spent in fighting a river, in battling with cataract after cataract, in rowing and steering and sailing and hauling a fleet of boats and supplies for an army up, up, up into unknown rapids, through a burning desert, such a long, long way. It would be an inspiration could we know in detail what these pilots did and suffered, what perils they defied, and how some of them perished—in short, what prob-

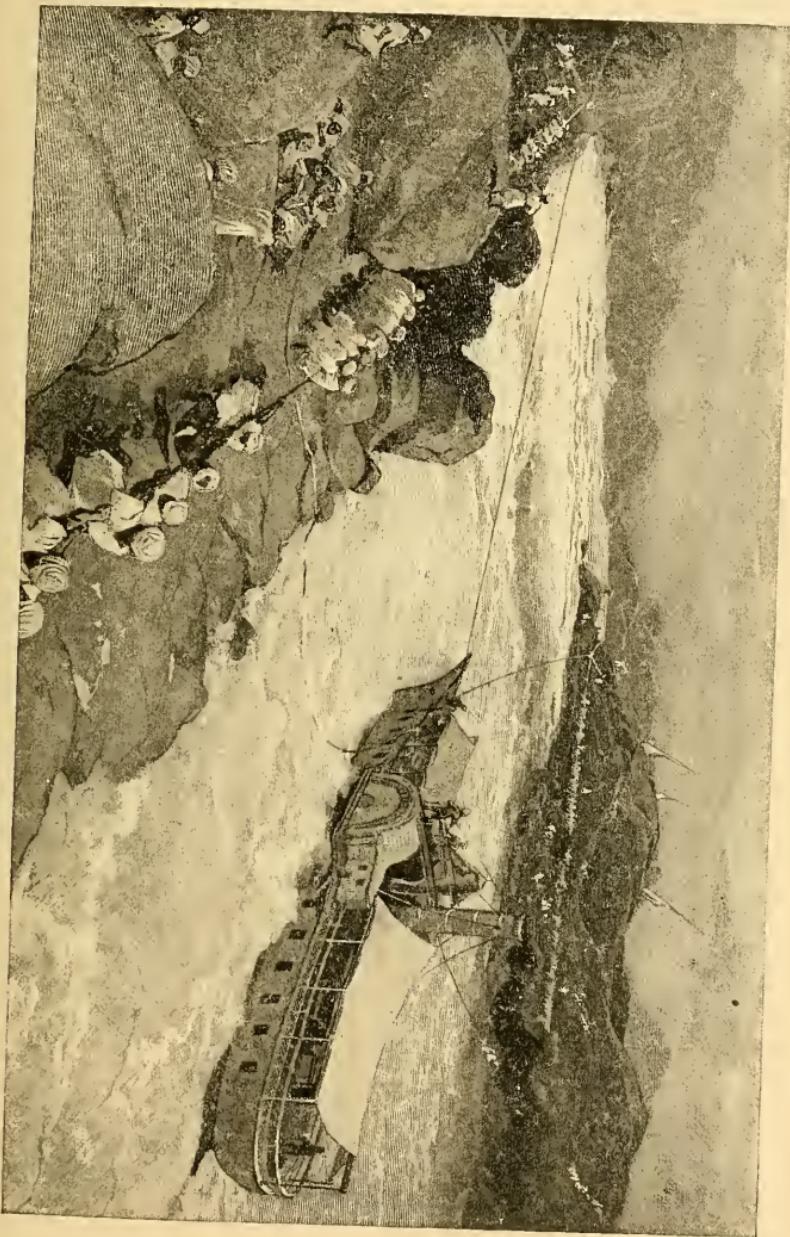
lems of the river they went at and how they fared in solving them. That would make a book by itself.

A few things we may know, however. This, for instance: that, while the maps put down six cataracts in the Nile between Cairo and Khartum, say fifteen hundred miles, there are, in truth, many more than six. Between the second and third alone there are more than six, and some of them bad. Also that the river beyond the third cataract curves away in a great rambling S, so that Lord Wolseley planned to send an expedition, as he actually did, straight on from that point by a short cut across the desert. The important thing then, and the difficult thing, was to reach the third cataract, and upon this all the skill of the voyageurs was concentrated.

The first cataract, about five hundred miles above Cairo, is fairly easy of ascent; the second cataract, some two hundred and fifty miles farther on, is perhaps the most dangerous of all, and resembles its rival at Lachine in this, that the Nile here strains through myriad foam-lashed islands strewn in the channel for a length of seven miles, like teeth of a crooked comb. A balloonist hovering here would see the river streaming through these islands in countless channels that wind and twist in a maze of silver threads. But to lads in the boats these silver threads were so many plunging foes, torrents behind torrents, sweeping down roaring streets of rock, boiling through jagged lanes of rock; and up that seven-mile way the pilots had to go and keep their craft afloat.

Jackson described the boats used in this hazardous undertaking. There were, first, the ordinary whale-boats, about twenty-five feet long and five feet high, with a crew of ten Dongolese at the oars, and two or three sails to catch the helpful northerly winds. Over-

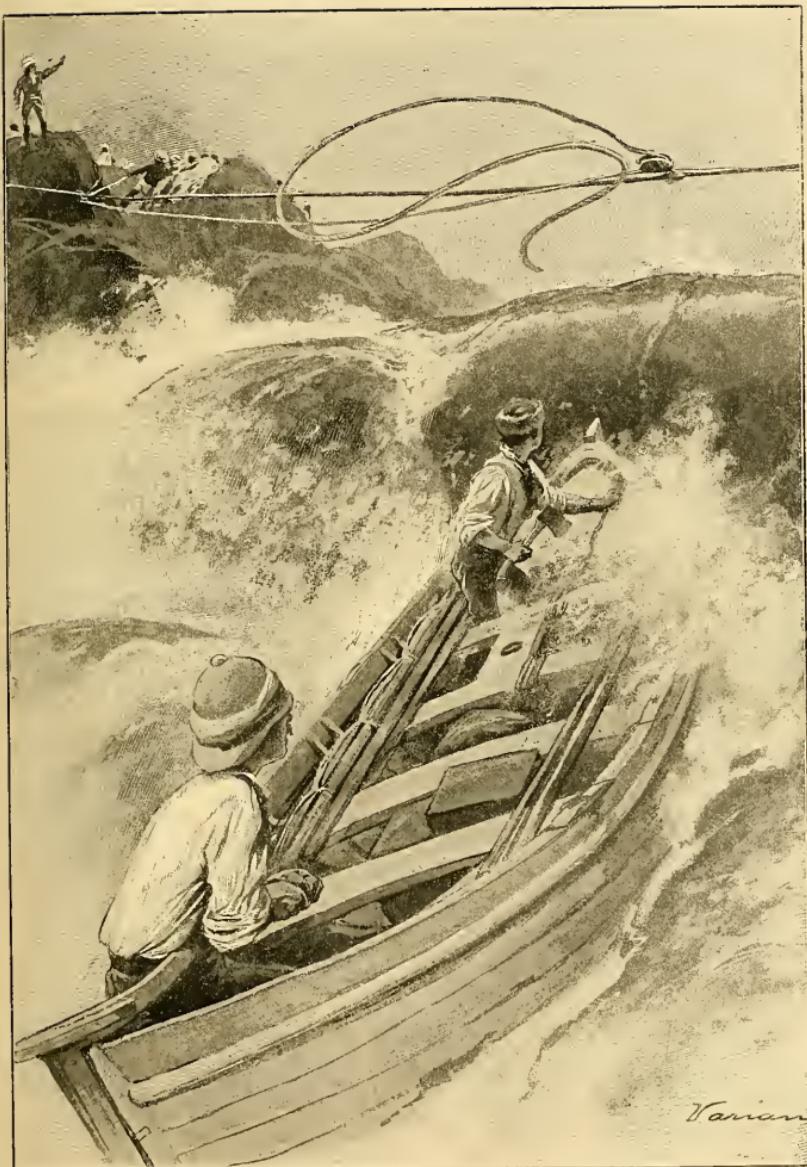
HAULING A STEAMER UP THE NILE RAPIDS.



head was an awning stretched against the scorching sun, and around the sides were boxes and bags of provisions and ammunition,—five or six tons to a boat,—piled high for shelter against bullets, for no one could tell when a band of Arabs, lurking at some vantage-point, might fall to picking off the men. At a cataract the crew would go ashore, save two, a voyageur in the stern to steer and another in the bow to fend off rocks, or, in case of need, give one swift, severing hatchet-stroke on the hauling-rope. For, of course, the ascending power came from a line of Dongolese, black fellows, with backs and muscles to delight a prize-fighter, who, by sheer strength of body, would drag the boat, cargo and all (or sometimes lightened of her cargo by the land-carriers), up, up, with grunting and heaving, against the down-rush of the river.

And woe to the boat if her hatchet-man fails to cut the rope at the very second of danger! So long as the craft can live his arm must stay uplifted; yet he must cut instantly when it is plain she can live no longer. And here one marvels; for how can anything be plain in a blinding, deafening cataract? And how shall the man decide, as they rise on a glassy sweep and hang for an instant over some rock-gulf beaten into by tons of water, whether they can go through it or not? Truly this is no place for wavering nerve or halting judgment. The man must know and act, *know and act*, because he is that kind of a man; and, even so, in hard places above the second cataract two Indians from Caughnawaga, Morris and Capitan, fine pilots both, held back their blades too long, or, striking as the boat plunged, missed the rope, and paid for the error with their lives.

And even with hauling-line cut in time, the pilots have only changed from peril to peril, for now they



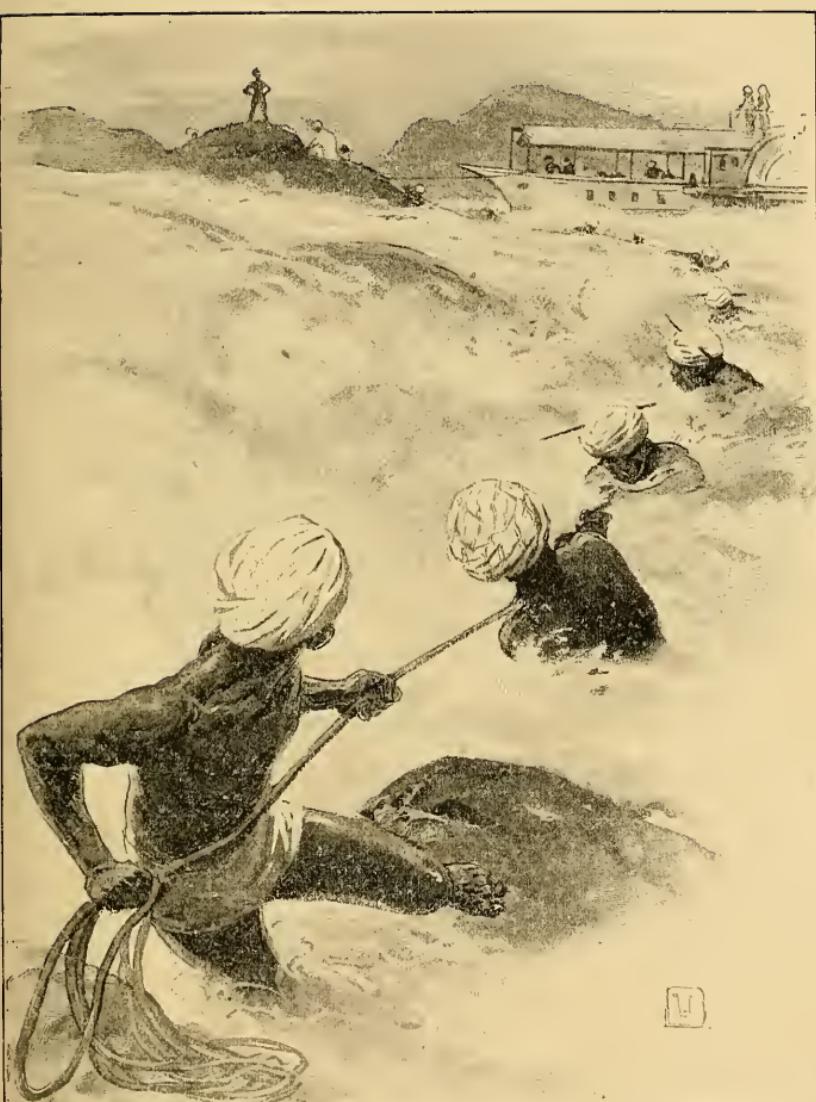
CUTTING THE LINE—A MOMENT OF PERIL.

are adrift in the cataract, and must shoot down unknown rapids, chancing everything, swinging into shore as soon as may be with the help of paddle and sail. Then is all to be done over again—the line made fast, the black men harnessed on, and the risk of a new channel encountered as before. Thus days or weeks would pass in getting the whale-boats up a single cataract.

And sometimes they would face the still more formidable task of dragging a whole steamboat up the rapids, with troops aboard and stores to last for weeks. Then how the hauling-men would swarm at the lines, and shout queer African words, and strain at the ropes, when the order came, until knees and shoulders scraped the ground! This was no problem for untutored minds, but took the best wits of Royal Engineers and gentlemen from the schools, who knew the ways of hitching tackle to things so as to make pulley-blocks work miracles. At least, it seemed a miracle the day they started the big side-wheeler *Nassif-Kheir* up the second cataract with five hawsers on her, three spreading from her bow and two checking her swing on either quarter, and her own steam helping her.

There stood five hundred Dongolese ready to haul, and there was the whole floating population—pilots, soldiers, and camp-followers—gathered on the banks to wonder and to criticize the job which nobody understood but half a dozen straight little men in white helmets, who stood about on rocks and snapped things out in English that were straightway yelled down the lines in vigorous Dongolese. It was Trigonometry speaking, and the law of component forces, and “Confound those niggers! Tell ‘em to slack away on that starboard hawser. Tell ‘em to *slack away!*”

It was respectfully presented to Mathematics, Esq.,



"OVER THEY WENT, THE WHOLE BLACK LINE OF THEM."



HOW THE ENGINEERS WERE CARRIED OVER TO THE NILE ISLANDS.

that the "niggers" in question could n't slack away any more without letting the hawser go or tumbling into the rapids, for they were on one of the little islands, on the brink of it, holding the steamer back while the land-lines hauled against them.

"Then in they go," ordered Trigonometry. "Tell 'em to get over to that next island. Tell 'em to get over *quick!*!"

And over they went, the whole black line of them, right through the rapids, swimming and struggling in the buffeting surge, getting across somehow, hawser and all, where white men must have perished. And the steamboat had gained a hundred feet.

Then one of the front lines of haulers in turn had to move forward to an island, to swim for it with six

hundred feet of hawser slapping the river as they dragged it. What a picture here as these naked men leaped in, fearless, each with a flashing bayonet thrust in his thick white turban! Mathematics, Esq., had no notion of trying this sort of thing when *he* changed islands, vastly preferring his pulley-blocks, and would presently be hauled across on a rope trolley, as passengers are swung ashore from wrecks by the life-saving men. That made a picture, too!

Thus, slowly and with infinite pains, they worked the patient steamboat, length by length, island by island, torrent by torrent, up through the Great Gate (Bab-el-Kebir), up to the very head waters of the second cataract; and there, with victory in their grasp, saw the forward hawser snap suddenly with the noise of a gun, and the old side-wheeler swing out helpless into the main rush of the river, swing clean around as the side-lines held, and then start down. Whereupon it was: "Cut hawsers, everybody!" and drop these pulley-blocks and tackle-fixings, useless now, and let her go, let her go, since there is no stopping her, and Heaven help the boys on board! Then, amid shouts of dismay, the big boat *Nassif-Kheir* plunged forward to her destruction, while the mathematical gentlemen stared in horror—then stared in amazement. For look! She keeps to the channel! She is running true! Wonder of wonders, she is shooting the rapids, shooting the greatest cataract of the Nile, where boat of her tonnage never passed before!

The *Nassif-Kheir* was saved, and every man aboard her, and every box of stores. She was saved by an humble Canadian pilot, who had never studied trigonometry, but who stepped to the wheel when he saw the peril, and steered her down those furious rapids as he had steered other boats down other rapids

on the old St. Lawrence. And after that, when the expedition found itself in trouble in the upper cataracts, say those of Tangoor or Akashe or Ambigole or Dal, and when the Royal Engineers had drawn up some neat plan with compasses and squares for doing a certain thing with a boat, and had proved by the books that it *could* be done, and agreed that it should be done forthwith, then some one would usually say, just at the last, as by an afterthought:

“I suppose we might as well have in one of those voyageur chaps, just to see what *he* thinks of it!”

And they usually had him in.

THE BRIDGE-BUILDER

I

IN WHICH WE VISIT A PLACE OF UNUSUAL
FEARS AND PERILS

AS I went time and again to the great East River Bridge, the new one whose huge steel towers were drawing to full height in the last months of the century, I found myself under a growing impression that here at last was a business with not only danger in it, but fear of danger. Divers and steeple-climbers I had seen who pronounced their work perfectly safe (though I knew better), and balloonists of the same mind about perils of the air; there were none, they declared, despite a list of deaths to prove the contrary. And so on with others. But here on the bridge were men who showed by little things, and sometimes admitted, that they were *afraid* of the black-ribbed monster. And it seemed to me that these were men with the best kind of grit in them, for although they were afraid of the bridge, they were not afraid of their fear, and they stuck to their job week after week, month after month, facing the same old peril until—well—

I came upon this fear of the bridge the very first time I sought leave to go upon the unfinished structure. It was in a little shanty of an office on the Brooklyn side, where, after some talk, I suggested to an assistant engineer, bent over his plans, that I would like to take

a picture or two from the top of the tower. That seemed a simple enough thing.

"Think you can keep your head up there?" said he, with a sharp look.

I told him I had climbed to a steeple-top.

"Yes. But you were lashed fast then in a swing, and had a rope to hold on to. Here you 've got to climb up by yourself without anything to hold on to, and it 's twice as high as the average steeple."

"How high is that?" I asked.

"Well, the saddles are three hundred and forty feet above the river."

"Saddles?"

"That 's what we call 'em. They 're beds of steel on top of the towers for the cables to rest on—nice little beds weighing thirty-six tons each."

"Oh!" said I. "How do you get them up?"

"Swing 'em up with steam-derricks and cables. Guess you would n't care for *that* job, hanging out on one o' those booms by your eyelashes."

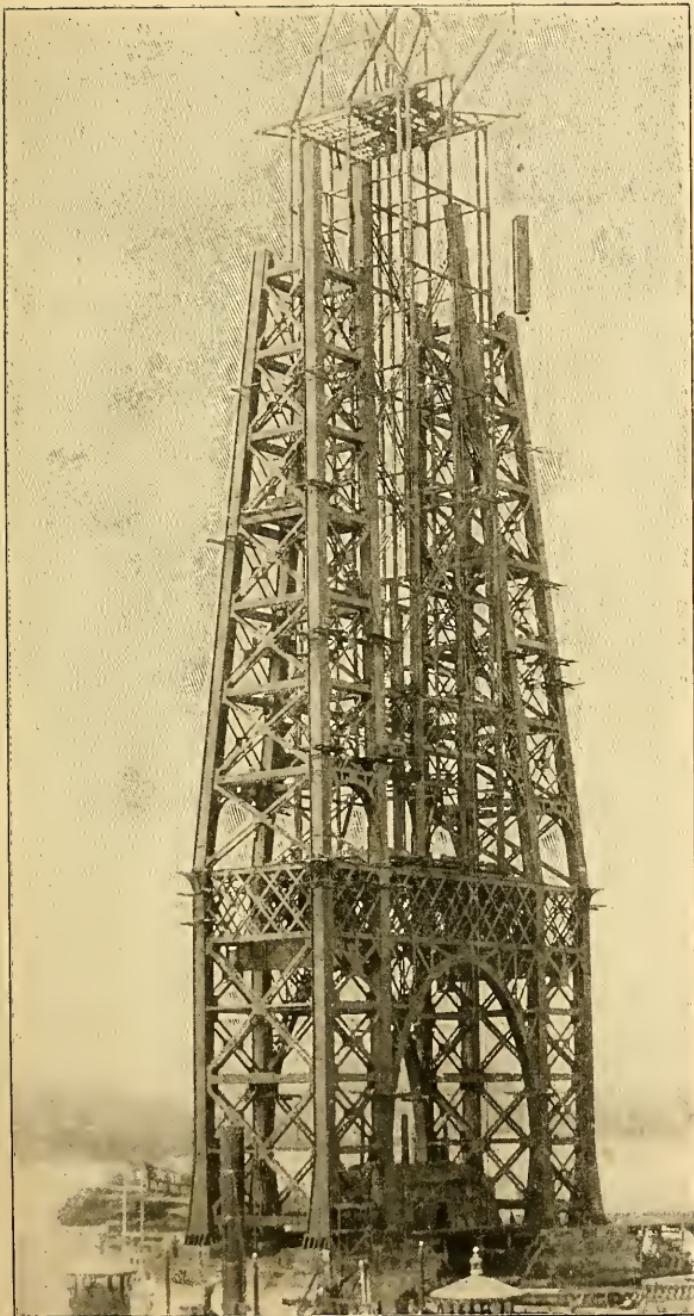
"Perhaps not," I admitted. "But I 'd like to watch it."

He said I must see somebody with more authority, and turned to his plans.

"You don't feel in danger yourself, do you," I persisted, "when *you* go up?"

"Don't, eh?" he answered. "Well, I nearly got cut in two the other day by a plate-washer. It fell over a hundred feet, and went two inches slam into a piece of timber I was standing on." Then he explained what havoc a small piece of iron—some stray bolt or hammer—can work after a long drop.

"That plate-washer," said he, "weighed only two pounds and a half when it began to fall; but it weighed as much as you do when it struck—and you 're a fair size."



THE WORK OF THE BRIDGE-BUILDERS. A TOWER OF THE NEW EAST RIVER BRIDGE. THIS PHOTOGRAPH ALSO ILLUSTRATES THE NARROW ESCAPE OF JACK MCGREGOR ON THE SWINGING COLUMN. (SEE PAGE 192.)

"Is that based on calculation," said I, "or is it a joke?"

"It 's based on the laws of gravitation," he answered, "and it 's no joke for the man who gets hit. Say, why don't you go down in the yard and look around a little?"

I told him I would, and presently went down into the yard, a noisy, confusing place, where the wind was humming through a forest of scaffolding that held the bare black roadway skeleton a hundred feet overhead. It was a long street of iron resting on a long street of wood, with timber and steel built up in X's on X's, the whole rising in an easy slant to yonder grim tower that loomed heavy and ugly against the sky, a huge bow-legged H with the upper half stretched to a great length, and each leg piled up with more black X's held by two enormous ones between. It looked for all the world as if it had come ready made in a box and had been jointed together like children's blocks, which is about the truth, for this great bridge was finished on paper, then in all its parts, before ever a beam of it saw the East River. As I drew near its feet (which could take a row of houses between heel and toe) I had the illusion, due to bigness and height, that the whole tower was rocking toward me under the hurrying clouds; and at first I did not see the workmen swarming over it, they were so tiny.

But they were making noise enough, these workmen, with their striking and hoisting and shouting. There was the ring of hammers, the *chunk-chunk* of engines, the hiss of steam, the mellow sound of planks falling on planks, and the angry clash of metal. Presently, far up the sides of the tower, I made out painters dangling on scaffolding or crawling out on girders, busy with scrapers and brushes. And higher still I

saw the glow of red-hot iron, where the riveters were working. And at the very top I watched black dots of men swing out over the gulf on the monster derrick-booms, or haul on the guiding-lines. And from time to time the signal-bell would send its impatient call to the throttle-man below, six strokes, four strokes, one stroke, telling him what to do with his engine, and to do it quick.

The yardmen seemed to get on in the din by a system of strange yells. Here were a score of sturdy fellows doing something with a long steel floor-beam. They were working in scattered groups, some on the ground, some on the roadway overhead. It was lower pulley-blocks, and spread out flapping cables, and hitch fast the load, all without any hurry. Suddenly a man at the left would put a hand to his mouth and sing out: "Hey-y-y!" and a man overhead would answer: "Yeow-yeow-yeow!" and then they all would cry: "Ho-hoo-ho-hoooo!" and up would go the floor-beam, twisting as she lifted, a nice little load of ten tons, and presently clang down on her lofty bed like a peal of high-pitched thunder.

I chanced to be talking with the yard foreman when there came such a sudden clang, and then I saw an easy-going, rather stolid man pass through a singular transformation. Like a piece of bent steel he sprang back, every muscle in him tense, and up came his arms for defense, and there in his eyes was the look I came to know that meant terror of the bridge, and fear of sudden death. To me, unfamiliar with the constant danger, that clang meant nothing; to him it was like a snarl of the grave.

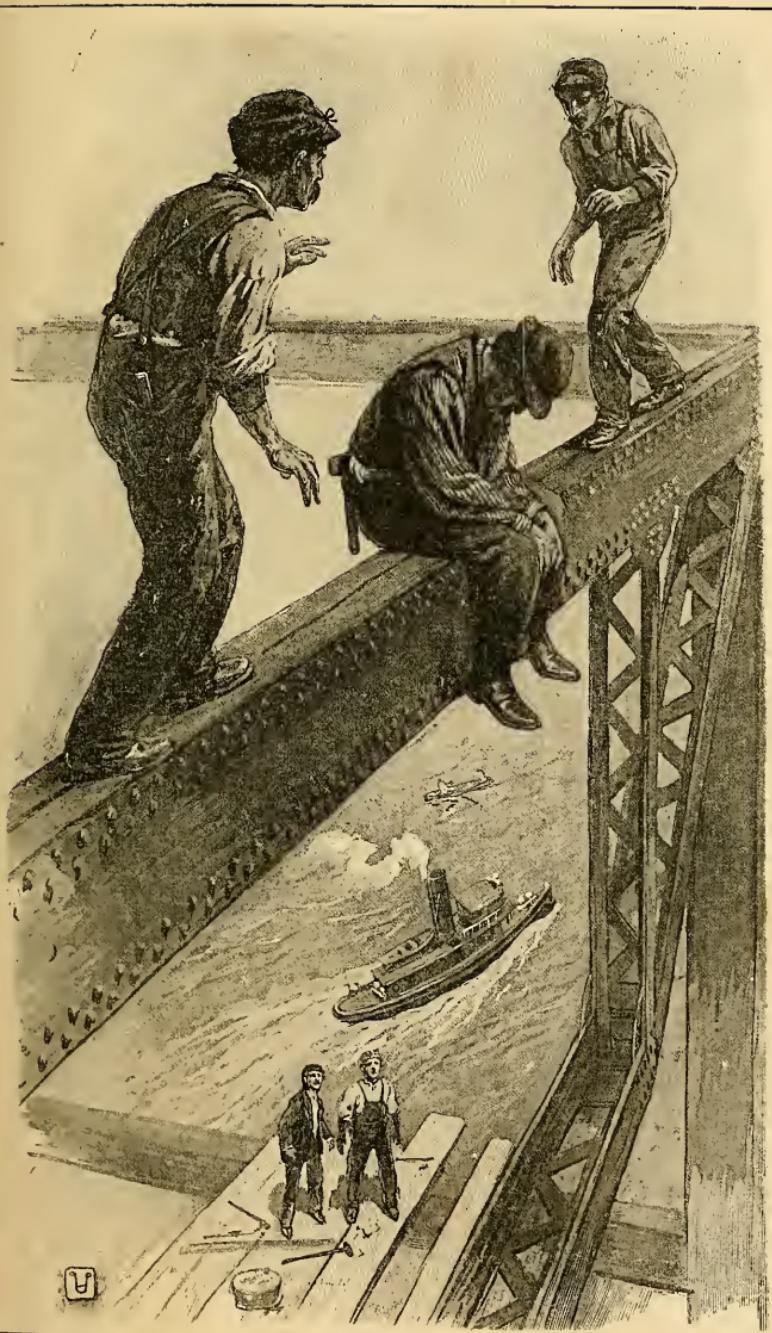
"Better stand back here," said he, and led me over by the air-compressing engine, where we were out of range.

Then he told how a superintendent of construction had been nearly killed not long before by a piece of falling iron, just where we were standing. And looking up through the criss-cross maze, with openings everywhere from ground to sky, with workmen everywhere handling loose iron, I realized that this was a kind of slow-fire battle-field, not so very glorious, but deadly enough, with shots coming from sky to earth every ten minutes, every half-hour—who can know at what moment the man above him will drop something, or at what moment he himself will drop something on the man below! A tiered-up battle-field, this, where each black X, with its hammers and bolts and busy gang, is a haphazard battery against all the X's below, and a helpless target under all the X's above.

"Why, sir," said the foreman, "that tower went into a reg'lar panic one day because some fool new man on top upset a keg o' bolts. Sounded as if the whole business was coming down on us."

I began to realize what tension these men work under, what vital force they waste in vague alarms!

"It 's queer, though," continued the foreman, "how the boys get used to it. See those timbers right at the top that come together in a point? We call that an A-frame; it 's for the hoisting. Well, the boys walk those cross-timbers all the time, say a length of thirty feet and a width of one. It 's nothing on the ground, but up there with the wind blowing—well, you try it. I saw one fellow do a thing that knocked *me*. He stopped half-way across a timber not over eight inches wide, took out his match-box, stood on his right foot, lifted his left foot, and struck a match on his left heel. Then he nursed the flame in his hands, got his pipe going good, and walked on across the timber. Wha' d' ye think of that? There he was,



“‘THERE WAS PAT, FAST ASLEEP, LEGS DANGLING, HEAD NODDING,
AS COMFORTABLE AS YOU PLEASE.’”

balanced on one foot, sir, with an awful death on either side, and the wind just whooping—all because his pipe went out. I would n't do it for—for— Well, I would n't do it."

"Why did n't he wait to light his pipe until he got across?" I asked.

The foreman shook his head. "I give it up. He just happened to think of it then, and he done it. That 's the way they are, some of 'em. Why, there was another fellow, Pat Reagan, as good a man as we 've got, and he went sound asleep one day last summer,—it was a nice warm day,—sitting on the top-chord. That 's a long, narrow girder at the very highest point of the end-span. First thing we knew, there was Pat, legs dangling, head nodding, comfortable as you please. A few inches either way would have fixed him forever; but he stuck there, by an Irishman's luck, until two of his mates climbed up softly and grabbed him. They did n't dare yell for fear he 'd be startled and fall."

While we were talking the wind had strengthened, and now every line and rope on the structure stood out straight from the sides, and swirls of spray from hoisting engines overhead flew across the yard, also occasional splinters. The foreman hurried a man aloft with orders to lash fast everything.

"There 's a hard blow coming up," he predicted, "and it 'would n't do a thing' to those big timbers on the tower if we left 'em around loose! People have no idea what force is in the wind. Why, sir, I 've seen it blow a keg of railroad spikes off that tower clean across the yard. And one day two planks thirteen feet long and two inches thick went flying over the whole approach-works right plumb through the front of a saloon out on the street. That made eight hundred feet the 'wind carried those planks. As for

coats and overalls, why, we 've watched lots of 'em start from the tower-top and sail off over Brooklyn city like kites—yes, sir, like kites; and nobody ever knew where they landed."

"I don't see how the men keep their footing in such a gale," I remarked.

"Well," said he, "we order them down when it blows an out-and-out gale, but they work in 'most anything short of a gale. And it 's a wonder how they do it. It 's not so bad if the wind is steady, for then you can lean against it, same as a man leans on a bicycle going around a curve; but—"

"Do you mean," I interrupted, "that they walk narrow girders leaning against the wind—against a hard wind?"

"Certainly; they have to. But that 's not the worst of it. Suppose a man is leaning just enough to balance the wind, and suddenly the wind lets up, say on a gusty day. Then where 's your man? Or suppose it 's winter and the whole bridge is coated with ice, so that walking girders is like sliding on glass. Then where is he, especially when it 's blowing tricky blasts? Oh, it 's no dream, my friend, working on a bridge!"

And I, in hearty accord with that opinion, betook me back to the office, where I read just outside the door this ominous notice: "All accidents must be reported as soon as possible, or claims therefor will be disregarded."

A workman came up at this moment, and, with a half-smile, asked if I knew their motto, the motto of the bridge-men.

"No," said I; "what is it?"

"'We never die,'" said he, with a grim glance at the notice; "'we don't have to.'" Then, pointing overhead: "Come up and see us. I 'll introduce you to the boys."

II

THE EXPERIENCE OF TWO NOVICES IN BALANCING ALONG NARROW GIRDERS AND WATCHING THE "TRAVELER" GANG

NOT that day, but later on, when I had arranged it, I accepted this bluff invitation and became acquainted with "the boys," the ones who "never die," and took in the fears and wonders of the bridge at closer view. My permit was granted on the express understanding that I hold nobody responsible for any harm that might befall. I was fortunate in having with me as companion in this climb Mr. Varian, the artist, who had faced perils of many sorts, but none like these.

First we clambered, pyramid fashion, up the pile of granite, big as a church, that will hold the cable-ends; they call it the anchorage. From the top of this we could look along the iron street that stretched away in a slight up-grade toward the tower. We were on a level with the roadway of the bridge, and far below us spread the house-tops of Brooklyn. Between our stone precipice and the iron street-end yawned a gulf that we drew back from, with water in its deepest bottom. Here the cables would be buried some day, sealed and cemented, piled over with masonry, to hold for centuries.

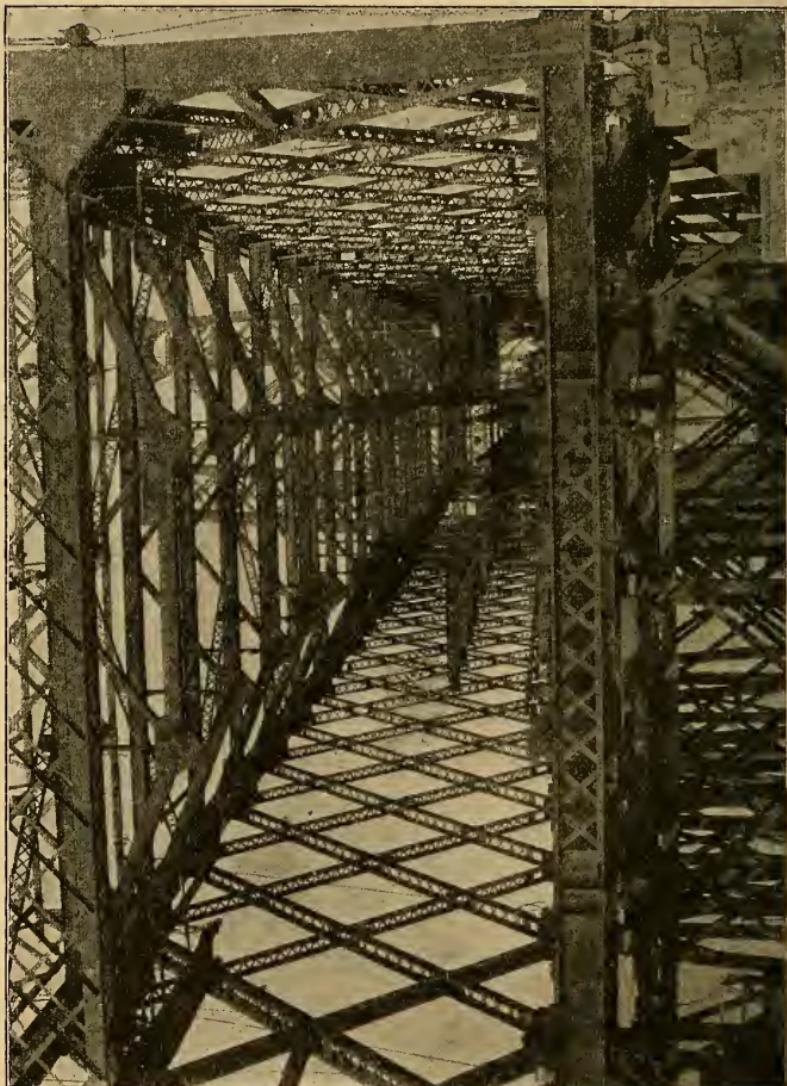
Standing in the lee of a block that kept off the wind, we looked across at the bridge, and planned how pres-

ently we might reach it by skirting the moat-walls and drawing ourselves up at yonder corner where the end-span rested.

Somehow, seen from here, the iron street looked delicate, not massive; its sides were trellis-work, its top frames gently slanting, and one could fancy the whole thing beautifully grown over with vines, a graceful arbor-way suspended in mid-air. And down the length of this came the strangest sounds—one would say a company of woodpeckers of some giant sort making riot in an echoing forest. *Br-r-r-ip-ip-ip-ip—br-r-r-r-up-up—br-r-r-ap-ap-ap-ap-ap*. What was it? Now from this side, *up-up-up-br-r-r-up-up*, and ending abruptly. Then straightway from near the top on the other side, *ap-ap-ap-br-r-r-r-ap-ap-ap*. Then fainter from half-way down the street, and then from all points at once, a chorus of hammer-birds making the bridge resound in call and in answer, hammer-birds with strokes as swift as the roll of a drum. What is it?

And look! Those points of fire that glow forth here and there and vanish as the eye perceives them, tiny red lights, tiny yellow lights, that flash from far down the iron street and are gone, that flash from all along the iron street and are gone! What are they? What strange work is doing here?

It was the riveters driving the endless red-hot bolts that hold the bridge together, driving them with hammers that you work with a trigger, and aim like a fireman's hose, hammers with rubber pipes dragging behind that feed in compressed air from an engine. Long past are the days when bolts were driven by brawny arms and the slow swing of a sledge. Now the workman, leaning his stomach against an iron club, touches a spring, and, presto! the hard-kicking, pent-



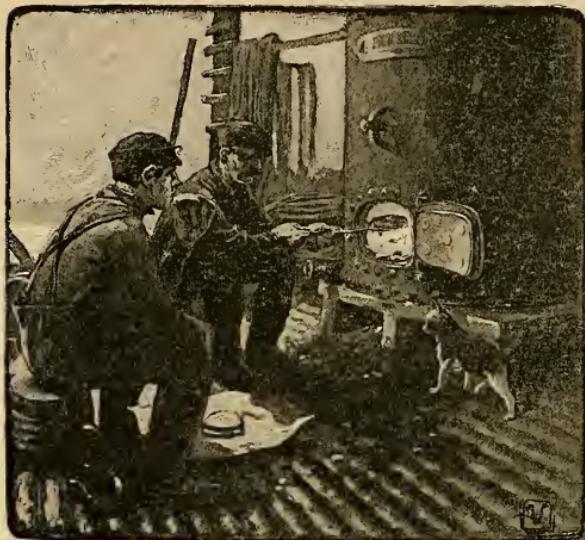
"THE IRON STREET LOOKED DELICATE, NOT MASSIVE."

up air inside drives the darting club-head back and forth, back and forth, quick as a snake strikes, *br-r-r-r-r-ip-ip-ip-ip*, against whatever the steering arms may press it. Driving rivets nowadays is something like handling a rapid-fire gun. And how your body aches from the bruise of that recoil!

"We must get nearer to those fellows," said the artist; and presently, after some mild hazards, we were safely over on the span, quite as near as was desirable to a gang of riveters dangling twenty feet above us on a swing. For presently, with a sputter of white sparks, a piece of red-hot iron struck the girder we were straddling, and then went bounding down—down—

"Nice, hospitable place, this!" remarked the artist, as we edged under cover of a wide steel beam.

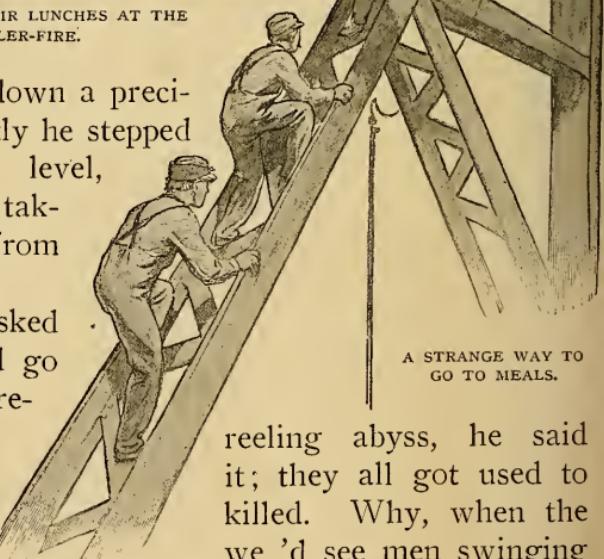
Crouching here, we watched another gang of riveters on the structure opposite, where we had a better view, watched the forge-man pass along the glowing rivets, and the buffer-man slip them through ready holes, and the hammer-man flatten the flaming ends into smooth, burnished heads. And presently a riveter in black cap and faded blue jersey climbed down from the swing overhead, and explained things to us. He did this out of sheer good nature, I think, although he may have been curious to know what two men with derby hats and kodaks were doing up there. We watched his descent in wonder and alarm, for it involved some lively gymnastics, that he entered upon, however, with complete indifference. First he swung across from the scaffolding to a girder, the highest rail of the bridge, and along this walked as coolly as a boy on a wide fence-top, only this happened to be a fence one hundred and fifty feet high. Then he bent over and caught one of the slanting side supports, and down this worked his way as a mountain-climber



WARMING THEIR LUNCHES AT THE BOILER-FIRE.

would work down a precipice. Presently he stepped off at our level, never having taken the pipe from his mouth.

When we asked how he dared go about so carelessly over a they all did it, or else got whistle blew



A STRANGE WAY TO GO TO MEALS.

reeling abyss, he said it; they all got used to killed. Why, when the we 'd see men swinging and sliding and twisting their way down like a lot of circus performers. That 's how they came to dinner; that 's how they got back aloft. No, sir; they could n't use life-lines; they moved about too much. Besides, what good would a life-line be to a man if the "falls"

started at him with a ten-ton load, yes, or a twenty-ton load? That man has got to skip along pretty lively, sir, or he 'll get hurt. Did he mean skip along over this web of boards and girders? I inquired. He certainly did, and we 'd see plenty of it, if we stayed up long. The artist and I shook our heads as we looked down that skeleton roadway, gaping open everywhere between girders and planks, in little gulfs, ten feet wide, five feet wide, two feet wide, quite wide enough to make the picture of a man skipping over them a very solemn thing.

Our friend went on to tell us how the riveters often get into tight places, say on the tower, where there is so little room for the forge-man to heat his bolts that he has to throw them up to the hammer-man, twenty or thirty feet.

"What!" exclaimed the artist. "Throw red-hot bolts twenty or thirty feet up the tower!"

"That 's what they do; and we 've got boys who are pretty slick at it. They 'll grab a bolt out of the fire with long-handled nippers, and give her a swing and a twist, and away she goes sizzling through the air straight at the man above; and say, they don't miss him once in a hundred times; and, what 's more, they never touch a truss or girder. If they did there 'd be a piece of red-hot iron sailing down on the lads below, and that would n't be good for their health."

"How does the hammer-man catch these red-hot bolts?" I asked.

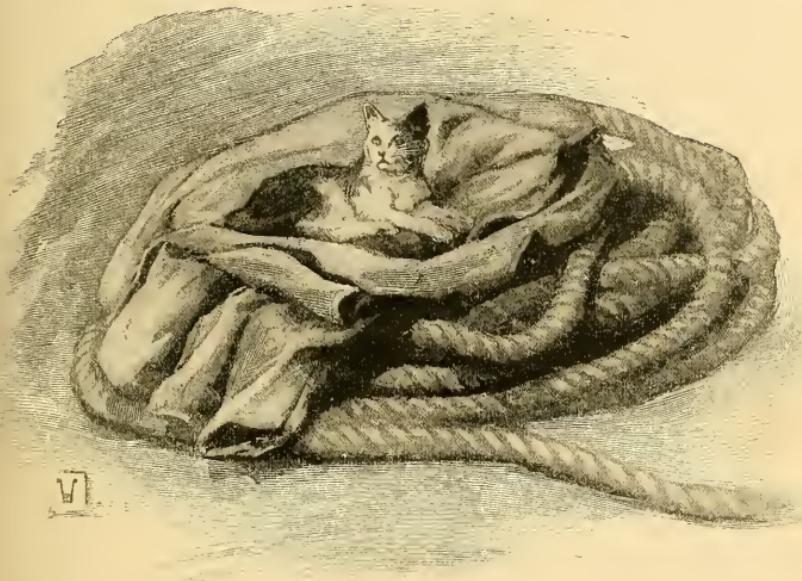
"In a bucket. Catches 'em every time. That 's a thing you want to see, too."

There were so many things we wanted to see in this strange region! And presently we set forth down the iron street, keeping in mind a parting caution of the riveter not to look at our feet, but at the way before

us, and never to look down. As we edged ahead cautiously (no skipping along for us, thanks, but pausing often, and holding fast to whatever offered support), we saw that all the bridge-men come over the girders, eyes straight ahead, in a shuffling, flat-footed way, without much bend in the knees. Look, there comes one of them in from the end of a long black arm that pushes out like a bowsprit over the gulf! He has been hanging out there, painting the iron. In the pose of his body he is a tight-rope walker, in the hitch of his legs he is a convict, in the blank stare of his face he is a somnambulist. Really he is nothing so complicated, but an every-day bridge-man earning a hard living; and his wife would be torn with fears could she see him now.

Presently we came to the busiest scene on the structure, down where the covered part ended and the iron roadway reached on, bare of framework, to the tower. Here the "traveler" was working with a double gang of men, raising a skeleton of sides and cross-beams that were pushing on, pushing on day by day, and would finally stretch across the river. Once on the "traveler's" deck, we breathed easier, for here we were safe from fearsome crevasses, safe on a great wide raft of iron and timber, set on double railroad tracks, a lumbering steam-giant that goes resounding along, when the need is, with its weight of four locomotives, its three-story derricks swinging out great booms at the corners, its thumping niggerhead engines (two of them) for the hoisting, its coal-bins, its water-tanks, its coils of rope, its pile of lumber, and its mascot kitten, curled up there by the ash-box in a workman's coat. They say the bridge has to wait when that kitten wants her dinner, and woe to the man who would treat the little thing unkindly!

This "traveler," with its gangs, is a sort of gigantic sewing-machine that stitches the bridge together; it lifts all the parts into place and binds them fast, as it were, with basting-threads of temporary iron, to hold until the riveters arrive for the permanent sewing. Five or six tons is the weight of ordinary pieces han-



"ITS MASCOT KITTEN, CURLED UP THERE BY THE ASH-BOX."

dled by the traveler, but some pieces weigh twenty tons, and, on a pinch, forty tons could be managed, the weight of six elephants like Jumbo. Of course, when I say that the traveler "stitches" these pieces together, I really mean that the "traveler" gangs do this, for the big brute booms can only lift things and swing things; the bolt-driving and end-fitting must be done by little men.

When we arrived the "traveler" was bringing to one spot the massive parts of a cross-section in our arbor-way. It was a stretched-out iron W, flattened down

between girders across top and bottom. This, we learned, was a "strut," and it weighed sixteen tons, and it would presently be lifted bodily overhead to span the roadway. We waited a full hour to see this thing done—to watch another stitch taken in the bridge; and it seems to me, as I think of it, that I can recall no hour when I saw so many perils faced with such indifference.

First, the booms would drop down their clanking jaws and grip the chain-bound girders from little delivery cars, then swing them around to the lifting-place at the farther end of the traveler. Now we understood what our friend down the way meant by "skipping along lively when the falls come at you." He meant this boom-tackle and its load as they sweep over the structure in blind, merciless force. And, indeed, they did skip along, the bridge-men, as the traveler turned its arms this way and that, and several times I saw a man slip as he hurried, and barely save himself. A single misstep might mean the crush of a ten-ton mass, or a plunge into space, or both. It seemed a pretty shivery choice.

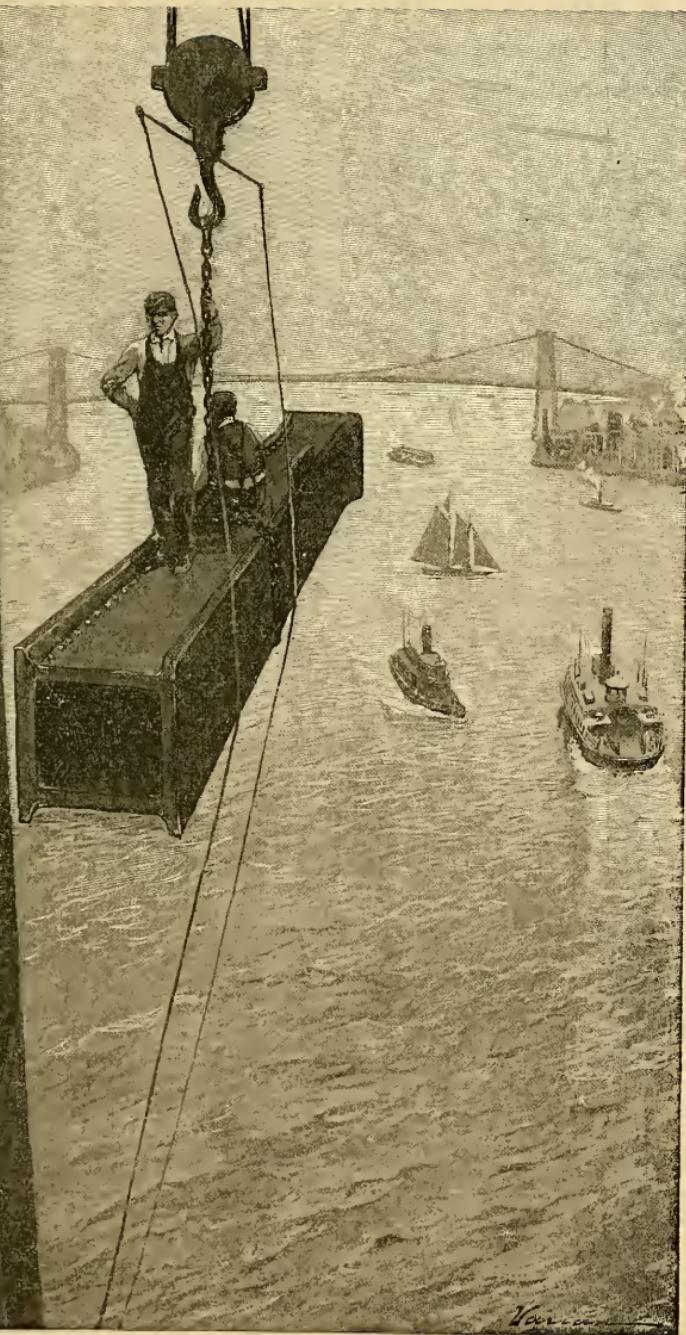
"One of our boys got hit this morning," said a man.
"Hit by the falls?"

"Yes; he tried to dodge, but his foot caught somehow, and he got it hard right here." He touched his thigh. "It flattened him out, just over there where that man 's making fast the load."

"Was he badly hurt?"

"Pretty bad, I guess. He could n't get up, and we lowered him in a coal-box with a runner; that 's a single line. You see, it 's very easy to take a wrong step."

Presently somebody yelled something, and this man moved away to his task; but we were joined almost



RIDING UP ON AN EIGHTEEN-TON COLUMN.

immediately by another bridge-man, who told us how they ride the big steel columns from the ground clear to the cap of the tower. Two men usually ride on a column, their duty being to keep her from bumping against the structure as she lifts, and then bolt her fast when she reaches the top. Of course, as a tower grows in height, these rides become more and more terrifying, so that some of the men who are equal to anything else draw back from riding up a column.

These fears were justified just at the last on the New York tower, and a man named Jack McGreggor had an experience that might well have blanched his hair. They had reached the 325-foot level, and were placing the last lengths of column but one, and McGreggor was riding up one of these lengths alone. It was a huge mass twenty-five feet long, square in section, and large enough to admit a winding ladder inside. It weighed eighteen tons. As the overhead boom lifted the pendent length (with McGreggor astride) and swung it clear of the column it was to rest on, the foreman, watching there like a hawk, wiggled his thumb to the signal-man on a platform below, who pulled four strokes on the bell, which meant "boom up" to the engine-man. So up came the boom, and in came the column, hanging now in true perpendicular, with McGreggor ready to slide down from his straddling seat for the bolting.

Now the foreman flapped his hand palm down, and the signal-man was just about to jerk two bells, which means "lower your load," when rip—smash—tear! Far down below a terrible thing had happened: the frame of the engine had snapped right over the bearing, and out pulled the cable drum that was holding the strain of that eighteen-ton column, and down came the falls. It was just like an elevator breaking loose

at the top of its shaft. The column started to fall; there was nothing to stop it; and then—and then a miracle was worked; it must have been a miracle; it is so extraordinary. That falling column struck squarely, end to end, on the solid column beneath it, rocked a little, righted itself, and stayed there! Which was more than Jack McGreggor did, for he came sliding down so fast—he came with a wild, white face—that he all but knocked the foreman over; and the foreman was white himself. And what that eighteen-ton column would have done to the bridge, and the boys on it, had it crashed down those three hundred and twenty-five feet, is still a subject of awed discussion.

All this time a dozen men have been swarming over the strut, hammering bolts, tightening nuts, hitching fast the "falls," making sure that all parts are rigid and everything ready for the lifting. At the front of the traveler two foremen, "pushers" they are called, yell without ceasing: "Hey, Gus! Hey! Hey, Jimmie! Put that winch in! Slack away them falls! What the mischief are you doing? Hey! Hey!" And they shake their hands and dance on their toes, for all the world like a pair of mad auctioneers.

The men work faster under this vigorous coaching. Four or five are stretched flat on their stomachs along the top girder, as many more cling to steep slanting braces, and some hang fast to the uprights, with legs twisted around them like Japanese pole-climbers. No matter what his position, every man plies a tool of some sort—wrench, chisel, or sledge, and presently all is ready.

Now the niggerheads start with a pounding and sputtering that make the bridge quiver. The big spools haul fast on the ropes, the falls stiffen, the booms creak, and with shouts from every one, the

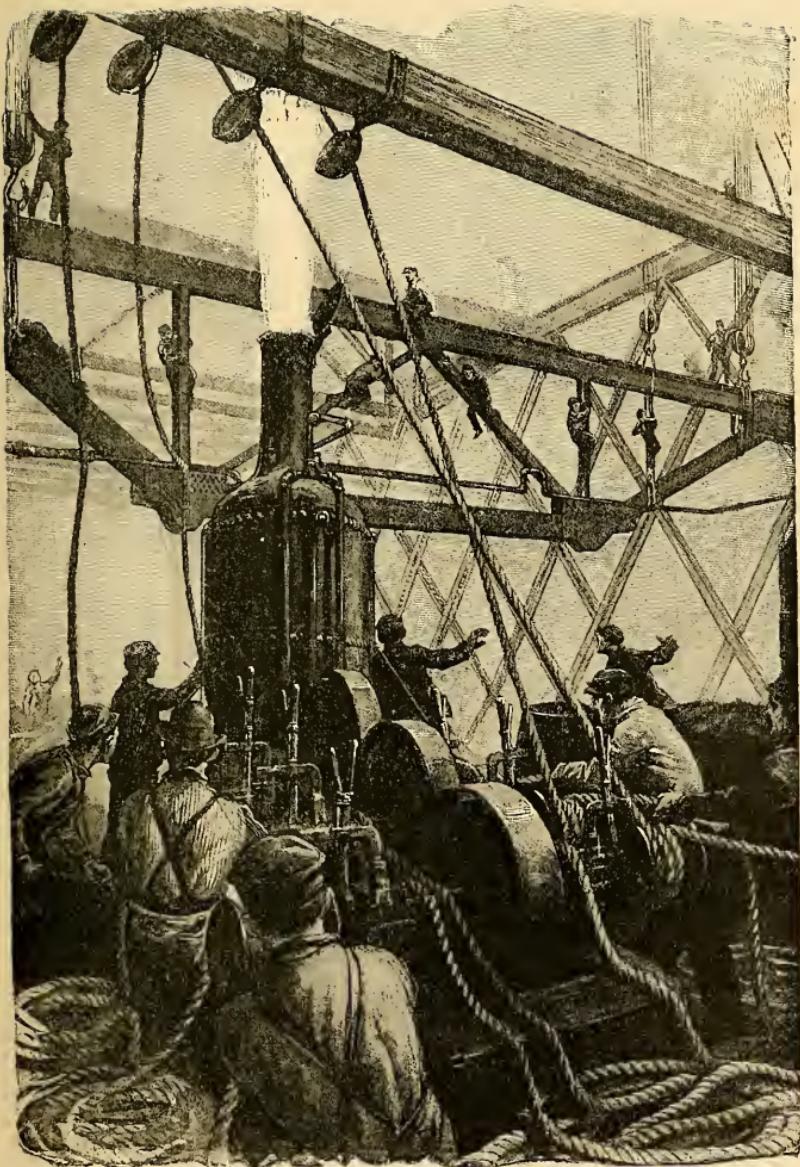
strut heaves and lifts and hangs suspended. The "pushers" yell at the niggerheads to stop. The men swarm over the load, studying every joint, then wave that all is well, and come sliding, twisting down just as the engines start again, all but two men, who sit at the ends and ride along with the hoist. Meantime the others are racing up the side frames, from slant to slant to the top of the truss, where they wait eagerly, yelling the while, at the points on either side, where presently the strut-ends must be adjusted and then bolted fast.

It seems like some mad school-boy game of romps. Now we 'll all swing over this precipice! Whoop-la! Now we 'll all run across this gulf! Wow! wow! wow! Every man in that scrambling crew is facing two deaths, or three deaths, and doing hard work besides. Look! There comes the strut up to its place, and nearly crushes Jimmie Dunn with its sharp edge, as a strut *did* crush another lad not so long ago. And see that man hang out in a noose of a rope, hang out over nothing, and drive in bolts. And see this fellow kick off on the free pulley-block and come sliding down. Hoooo! And there are the others jumping at the falls after him, and coming down with a rush, laughing. Risking their lives? One would say they never thought of it.

"Why, that 's nothing!" said one of them; "we used to slide down the falls from the top of the tower. But you 've got to know the trick or the ropes 'll burn through your trousers. It 's a great slide, though."

"Are n't you ever afraid of falling?" I asked a serious-faced young man who was running one of the niggerheads.

"I 'll tell you how it is," said he; "we 're not afraid when a lot of us do a thing together, but each one



ON THE "TRAVELER." HOISTING A STRUT.

might be afraid to do it alone. In our hearts I guess we 're all afraid."

"Ever have an accident yourself?"

"No," he said, "but—" He hesitated, and then explained that he had been standing near the day "Chick" Chandler fell from the Brooklyn tower. It hadn't been a nice thing to see, and—

Finally I got the story. Chandler, it seems, was the first man killed on the bridge, and he died for a jest. He was working that day on the one-hundred-and-ten-foot level; he was an experienced man and counted sure of foot. It had begun to sprinkle, and the men were looking about for their rain-coats, when Chandler, in a spirit of mischief, started across a girder for an oil-skin that belonged to a comrade. And so interested was he in this little prank that he forgot prudence, perhaps forgot where he was, and the next second he was falling, and presently there was the shock of impact far below, and then a red No. 1 was branded on the ugly black bridge.

III

WHICH TELLS OF MEN WHO HAVE FALLEN FROM GREAT HEIGHTS

THERE is this to note about falls from bridges, that the very short ones often kill as surely as the long ones. They told me of one case where a man fell eight feet and broke his neck, while other men have fallen from great heights and escaped. A workman of the Berlin Bridge Company, for instance, fell from a structure in New Hampshire, one hundred and twenty feet, and lived. And I myself saw Harry Fleager on the East River Bridge, New York, and from his own lips heard his remarkable experience. Fleager is to-day a sturdy, active young man, and when I saw him he was running a thumping nigger-head engine on the end-span. Nevertheless, it was only a few months since he had fallen ninety-seven feet smash down to a pile of bricks.

“It happened this way,” said he. “One of the big booms broke under its load just over where I was standing, and the tackle-block swung around and caught me back of the head. That knocked me off the false work, and I went straight down to the ground. Just to show you the force of my fall, sir, I struck a timber about thirty feet before I landed; it was eight inches wide and four inches thick, and I snapped it off without hardly slowing up. After that I lay for a week in the hospital with bruises, but there was n’t a bone broken, and I ’ve been at work ever since.”

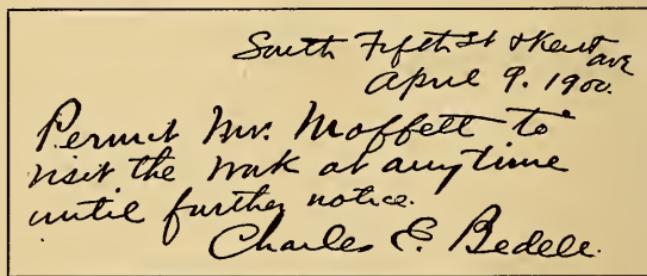
Several times while I was seeking permission to go up on the structure I was treated to stories like this and to mild dissuasion. It was too dangerous a thing, they said, for a man to undertake lightly. And I did not succeed until I met the engineer in charge, Charles E. Bedell, a forceful, quiet-mannered man, who, after some talk, granted my request. He did not dwell so much on the danger as the others had, although he did say: "Of course you take all the risks."

"Do you think they are very great?" I asked.

"Not if you use ordinary caution and are not afraid."

Fear was the fatal thing, he said, and he told me of men who simply cannot endure such heights. Every day or two some new hand would start down the ladders almost before he had reached the top, and come into the office saying he could n't stand the job.

"But you go ahead," said Mr. Bedell; "you 'll come through all right. Just take it easy and be careful." Then he handed me a permit.



We have seen how I fared on the bridge; let me show now what befell this brilliant young engineer a couple of months later, and observe how his own case illustrates the paralyzing effect of fear upon a man. For months he had gone over the structure daily, as sure of himself at those giddy heights as on

the ground. He never took chances, and he never felt afraid. But one day a workman fell from far above him and was crushed to death right before his eyes, and this was more of a shock to him than he realized.

How much of a shock it had been was shown weeks later, when the hour of peril came. It was a pleasant day in September, and the bridge was singing its busy song in the morning sunshine. The engineer in charge had made his round of inspection, and was standing idly on the false work under the end-span. He was just over the street, and could look down upon his own office, a hundred feet or so below. Every timber and girder here was familiar to him. Rumbling along on the trestle track came the big "traveler," its four booms groaning under their iron loads. The "traveler" came on slowly, as befits a huge thing weighing one hundred and fifty tons. The engineer was whittling a stick. The "traveler" came nearer, with one of its booms swinging toward Bedell, but lazily. He had plenty of time to step aside. One step to the right, one step to the left, one step forward was all he need take. Of course, he would not think of taking a step backward, for there was destruction—there yawned the gulf. It was inconceivable to the man on the "traveler" that his chief, who knew all about everything, would take a step backward.

Still the engineer in charge did not move. The boom swung nearer. Still he whittled at his stick. His thoughts were far away. The man on the "traveler" shouted, and Bedell looked up. Now he saw, and the sudden fear he had never known surged in his heart. He had still time to step aside, but his mind could not act. The boom was on him. Up went his right arm to clutch it, and back reeled his body. His right hand missed, his left hand caught the stringer as he fell,

caught its sharp edge and held there by the fingers—the left-hand fingers—for five, six, seven seconds or so, legs swinging in the void. Down sprang the man on the “traveler,” and leaped along the ties to his relief, and reached the spot to find the fingers gone, to see far below on the stones a broken, huddled heap that lay still. So died the man who had been kind to me (as they say he was kind to every one), and who had warned me to “take it easy and be careful.”

Despite the constant peril of their days, the nights of bridge-builders are often spent in gaiety. The habit of excitement holds them even in their leisure, and many a sturdy riveter has danced away the small hours and been on his swing at the tower-top betimes the next morning. They are whole-souled, frank-spoken young fellows (there are few old bridge-men), and to spend an evening at their club, on West Thirty-second Street, is a thing worth doing.

On the street floor is a café, not to say saloon, where the walls are hung with churches and bridges and towering structures, monuments to the skill of the builders who have passed this way. And if you will join a group at one of these tables and speak them fair you may hear enough tales of the lads who work aloft for many a writing. And up and down the stairs move lines of bridge-men, all restless, one would say, and some pass on crutches and some with arms in slings (there is a story in every cripple), and you hear that New York has half a dozen one-legged bridge-men still fairly active in service. It’s once a bridge-man always a bridge-man, for the life has its fascination, like the circus.

As I sat in a corner one evening with Zimmer and Jimmie Dunn and some of the others, there came down from overhead a racket that almost drowned our buzz

of talk and the frequent ting of the bar register. The bridge-men were in vigorous debate over the question whether or not the interests of the craft call for more flooring on dangerous structures. Some said "yes," some "no," and said it with vehemence. More flooring meant less danger. That was all right, but less danger meant more competition and less pay. So there you are, and the majority favored danger with a generous wage.

"What kind of men make bridge-men?" I inquired.

"All kinds," said one of the group who was drinking birch-beer. "Some come out of machine-shops, some out of locomotive works, I was a 'shanty-jack.' "

"Lots of 'em come from farms," added another. "I know one fellow tried it who 'd been a tailor. Said he changed for his health."

This struck the company as highly amusing.

"There 's lots of 'em try it and quit," remarked Jimmie Dunn, who is one of the oldest and also one of the youngest men in the guild. I had seen him nearly killed a few days before by the sudden up-swing of a sixteen-ton strut. "I knew a telegraph-pole climber who said he did n't mind any old kind of a tower; he 'd go up it all right and work there. Well, he got all he wanted the first morning. Came down white as that paper. Said he would n't stay up half an hour longer if they 'd give him the whole blamed bridge. Why, it gets *us* fellows dizzy once in a while."

"I 'll bet it does," agreed the shanty-jack man. "I saw an old hand once start to ride up a barrel of water one hundred and seventy feet on a bridge over the St. Lawrence. The barrel was swung on a 'single runner,' and you ought to have seen it spin with his weight tipping it lopsided! Ain't any bridge-man going could have kept his head there. 'T was a fool thing to do,

and the only way this fellow got up alive was by dropping plumb into the barrel of water and shutting his eyes."

"Talking about close calls," spoke up Zimmer, "I can beat that. It was out in Illinois. We were riveting on a high building, where the roof came up in a steep slant from each side to a ridge at the top. There were about twenty of us on this roof, and the way we 'd work was in pairs, one man on one side and his partner on the other side, with a rope between 'em, reaching over the ridge, and the two men hung at the two ends, each one balancing the other, like two buckets down a well. We had to get up some scheme like that, or we could n't have stuck on the roof; it was too steep.

"Well, that was all right as long as both men kept their weight on the rope, but you can see where one would be if the other happened to let go. He 'd be chasing down a nice little hill of corrugated iron on a sixty-degree slant, and then over the eaves for a hundred-and-ten-foot drop. It was n't any merry jest, you 'd better believe, but we did n't think much about it and riveted away, until one morning a fellow on my side got his foot out of the noose somehow, and began to slide down. Say, he was about as cool a man as I ever heard of. I 'll never forget how he sort of winked at me as he started, and what he said.

"'Going to blazes, I reckon,' said he. Those were his very words. And down he went; could n't stop himself, and we could n't help him, it all happened so quick. He got to the eaves, his feet went over, he was just plunging into space when his overalls caught on a rivet that somebody had left sticking up there. And there he stuck. Then he said, with just the same comical look, 'Saved by a miracle, by thunder!'



WALKING A GIRDER TWO HUNDRED FEET IN AIR.

"Must have been a double miracle, for the man on the other side started to drop, too, when the rope slacked, and he'd have been killed sure if a knot in the rope had n't happened to catch under a piece of loose iron on the ridge. Say, it's that kind of business whitens out a man's hair."

"It's a bridge-man's fate settles these things, friends," commented another member of the group. And he instanced a case where this fate had followed in cruel pursuit of two brothers named Johnson, Michael and Dan, good men both on the girders. Dan, it seems, had been crushed by a swinging load on a West Virginia bridge, and lay crippled in the hospital, only the wreck of a man, whereupon Michael, zealous in his brother's cause, had followed the work over into Kentucky, where a bridge was building across the river at Covington. His purpose was to bring suit against the company for the injury done to Dan.

"And here came the fateful part of it, for scarcely had Michael set foot upon the structure—he had certainly not been ten minutes upon it—when the false work gave way and two iron spans, unsupported now, tipped slowly, then smashed down into the river, carrying with them ruin and death. In this catastrophe were numbered some dozens of wounded and killed, and among the latter was Michael Johnson, found under the river standing upright in a tangle of wreckage, caught and held by the bridge-man's fate."

Then another man told the story of a falling bridge that thrilled me more than this one, although there was in it no loss of life. I always feel that a man who faces death unflinchingly for a fairly long time shows greater heroism, even though death be driven back, than another man who suffers some sudden taking off

with no choice left him. This bridge was building at White River Junction, Vermont, over the upper waters of the Connecticut. There was a single iron span reaching two hundred feet between piers of masonry, and everything was ready to swing her off the false work except the driving of a few iron pins. And a bridge swung is a bridge practically finished, so it was merely a matter of hours to put the contractors at ease of mind against any dangers of the torrent. Meantime the dangers were there, for heavy rains had fallen and angered the river with a gorge of mountain streams.

At five o'clock of an afternoon the engineer in charge saw that a crisis was approaching. The waters were sweeping down runaway logs in fiercer and fiercer bombardment, and it was a question if the false work could hold against them. And for the time being, until morning surely, the false work must carry the span. If the false work went the span would go, and the bridge would be destroyed.

So the chief engineer ordered all hands down on scows and rafts, which were straightway jammed close against the false work by the current. Down on these lurching platforms went seventeen bridge-men, and set to work with iron-shod pike-poles, spearing the plunging logs as they came by and swinging them out through the bents of false work, down roaring lanes of water twenty feet wide between the legs of scaffolding. If these could be protected from the logs, the bridge might be saved; if they could not be protected, the bridge was doomed. It was the strength and skill of the pike-pole lads against the fury of the river.

For nine hours the battle lasted, and all this time the bridge-men worked wonders down in the black

night, with rain beating on them in torrents and the logs coming faster and harder as the hours passed. Every man in the crew realized that the false work might give way at any moment, for the whole structure was groaning and shivering as they swung against it, and they knew that if it went at all it would go as one piece, without a moment's warning. And that would mean sudden death in the river under the crush of a broken bridge. Yet no man shirked his duty, and long after midnight they were there on the scows still, fighting the logs with bridge-men's grit and the comfort of steaming hot coffee—well, we may call it coffee.

But it was a hopeless fight now; the engineer saw this, and at two o'clock ordered all hands off the scows and back to the shore. There is a point beyond which you cannot allow men to go on offering their lives. And scarcely five minutes later—indeed, the last man was barely off the structure, so our friend declared, and he was one of the seventeen—the false work ripped loose and was swept away, and the iron span crashed down into the furious flood.

After this Zimmer described his sensations in a fall of one hundred and thirty-five feet from the eighth story of a skyscraper they were putting up out West. He was sitting on an upright column of the steel skeleton, waiting to pin fast a cross-beam, when a girder swung over from the other side and struck him. It weighed a matter of six tons. Down went Zimmer, and, as he dropped, he caught at a granite block resting loose there and toppled it over with him. And the thought in his mind as he fell was that here was an interesting illustration of what he had learned at school about a heavy body falling faster than a light one, for although he had a start of eight feet on the granite

block, it passed him one story down, and smashed ahead through a staging that might have saved him. Then, as the stone sheered off, he estimated, did Zimmer (falling still), that its weight was about fifteen hundred pounds. Then he himself smashed through two stagings and caught at a rope, which burned through his gloves, and the next thing he knew was days later at the hospital, where somebody was bending over him saying: "Will you please tell me about your sensations coming down?" "And there was a newspaper reporter trying to interview me," said Zimmer, "which is what you might call rushing things."

"Tell ye a fall that stirred us boys all right," said another man. "It was in the big shaft at Niagara Falls. You know where they send electricity all over the State. The shaft was a hundred and eighty feet deep, and they used to lower us down in a boat swung from an iron cable. Well, one day the drum slipped and let the whole business fall free with five of us in the boat. We went clear down one hundred and seventy feet, and the boat fell away under us just like that granite block of Zimmer's, and there we were hanging fast to the corner chains and every man of us expecting to die. But somehow the engineer got his brakes on just as we were ten feet above bottom, and blamed if we did n't land fairly easy without a man hurt. Just the same, we 'd looked over our lives pretty well in those few seconds."

After this came tragic memories from other men. One recalled the terrible wreck of the Cornwall bridge over the St. Lawrence. Another the disaster at Louisville, when two great iron spans, reaching a thousand feet, went down into the Ohio, with false work, "traveler," and sixty-five men, of whom only four escaped. "And one of the four, sir, was on the "traveler," two

hundred feet above the water, when she went down. Never had a scratch."

So the talk ran on, and I came away with mingled feelings of wonder and admiration and sadness. Here are men who leave their families every morning with full knowledge that before nightfall disaster may smite them, as they have seen it smite their comrades. Why, one asks, do they keep to such a career? And if they believe, as apparently they do, that bridge-men are fated to violent death, why do they not leave this work and seek a safer calling?

I suppose the same reason holds them to the bridge that holds the diver to his suit, the climber to his steeple, each one of us to his particular path—it is so hard to find another. And then there is the lash of pressing need, the home to keep, and no time for experiment. Yet there are the hard facts always, that no insurance company will take a risk upon these lives, that bridge contractors are not philanthropists nor issuers of pensions, and that if a man fall from the structure, say at 11.50 A.M., his pay stops short not at twelve o'clock, but at ten minutes before twelve. Which is probably excellent business, although it seems poor humanity.

THE FIREMAN

I

WHEREIN WE SEE A SLEEPING VILLAGE SWEPT
BY A RIVER OF FIRE AND THE BURNING
OF A FAMOUS HOTEL

I WILL first tell a story, fresh in my memory, about a New Jersey village lost in the hills back of Lake Hopatcong, a charming, sleepy little village that reaches along a stream fringed with butterball-trees and looks contentedly out of its valley up the steep wooded hill that rises before it. Nobody in Glen Gardner cares much what there is in the world beyond that hill.

The general attitude of Glen Gardner toward progress is shown well enough by this, that the village could never see the use of a fire department. They never had one, and never proposed to; other people's houses might get on fire; theirs never did. As a matter of fact, nobody could remember when there had been a fire in Glen Gardner, unless it was Aunt Ann Fritts, who was eighty-eight years old, and remembered back farther than was necessary.

This was the case on a certain drizzling Sunday in March of the new-century year, when, at 6.30 A.M., the world beyond the hill intruded itself upon Glen Gardner's peacefulness in such strange and sudden fashion that old Mrs. Bergstresser collapsed from the shock. What made it worse was the fact that there had



BURNING OIL-TANKS.

been a dance the night before at Farmer Apgar's, and half-past six found most of the village dozing comfortably. There was really nothing to do before church-time. So they all thought, at least, little suspecting that even now, as they slept, a long oil-train was puffing up the steep grade from Easton, bringing sixty cars loaded with crude petroleum and trouble.

On came the oil-train, its front engine panting as the drivers slipped, and the "pusher" back of the caboose shouldering up the load with snorts of impatience. *Ouf!* The front of the train climbs over the ridge at Hampton Junction, half a mile back of Glen Gardner, where the Jersey Central tracks reach their highest point. Now they are all right. There is a long down grade ahead for three miles. The pusher gives a final shove at the rear end, and cuts loose, glad to be rid of the job. The men in the caboose wave good-by to the fireman and engineer as they drop away.

Hello! What 's that jerk? They look out and see the last oil-car just clearing the divide. It 's nothing; they 're over now; they 're running faster. Queer place, this! There 's a spring here with two streams that part in the middle like a woman's hair; one goes down the east side, the other down the west side. What? Broken in two?

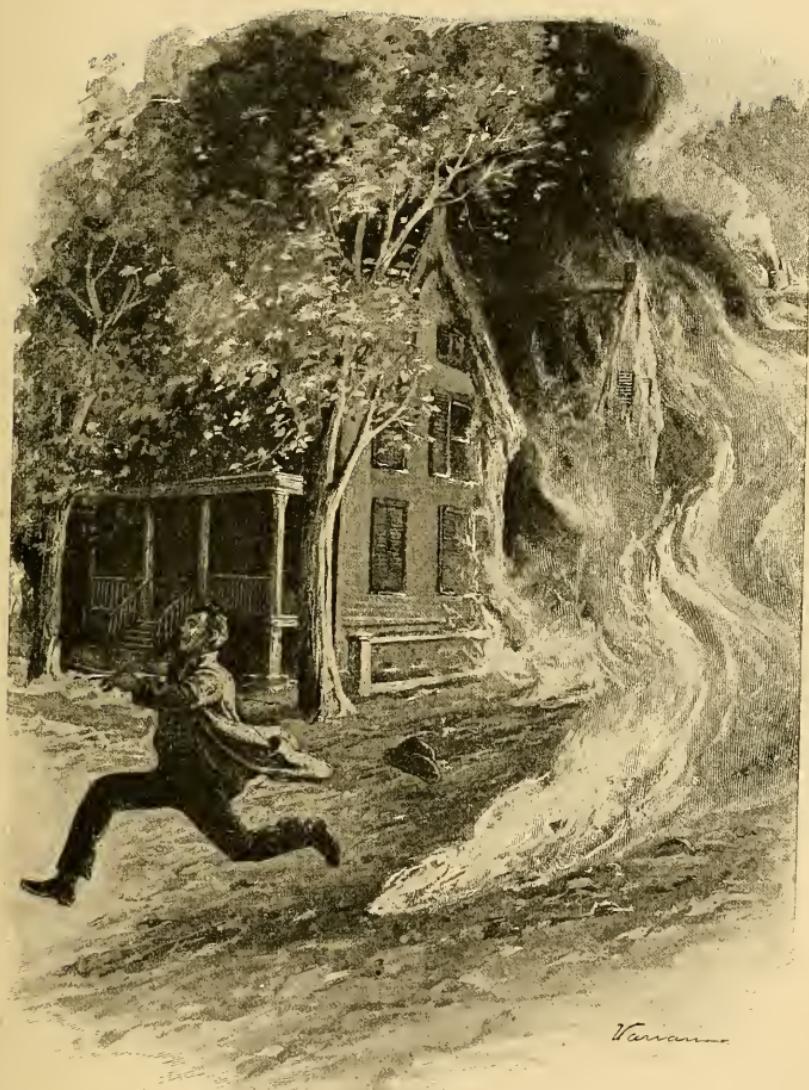
The caboose crew start to run forward; a brakeman on the front half starts to run back. Thirty-seven cars behind the engine a coupling has snapped, and the train is taking the down grade in two sections: twenty-three loaded oil-cars are running away, and a million gallons of oil are chasing two million gallons down a mountain-side!

Everything now depends upon the brakeman on the forward section. He is the only man who can judge

the danger, and signal the engineer what to do. The engineer does not even know that anything is wrong. It is plainly the brakeman's business to keep the front half of the train out of the way of the rear half. They must go faster, faster as the runaway cars gain on them. Any one can see that it is undesirable to have two million gallons of oil struck by a million gallons coming at forty miles an hour.

Yet the brakeman does the wrong thing (no man can be sure how he will act in imminent peril); the brakeman signals the engineer to stop. Perhaps he planned a gradual slow-up to block the flying section gently; perhaps he did not realize how fast the runaway was coming. Most likely he lost his head entirely, as better men have done in less serious crises. At any rate, the front section presently drew up with grinding brakes on the ledge of track that stretches along the cheek of the mountain just over the slope where the slumbering village lay, not five feet from Carling's warehouse, beyond which were the coal-yards and the wooden houses of Glen Gardner, the post-office, the hardware store, and the main street. Of all places for that train to stop, this was the worst.

It was a matter of seconds now until the crash came, and on this followed a shattering blast that shook the valley and hill, and brought the village to its feet in a daze of fear. Four oil-cars were smashed in the wreck and hurled across the tracks for the rear cars to pile up on. And straightway there was a gushing oil-well here, out of which in the first ten seconds came an explosion with the noise of cannon, that showered burning oil over fields and trees and shingled house-tops, while a fire column shot up fifty feet in the air and began its fierce feeding on the broken tanks. And



Varian

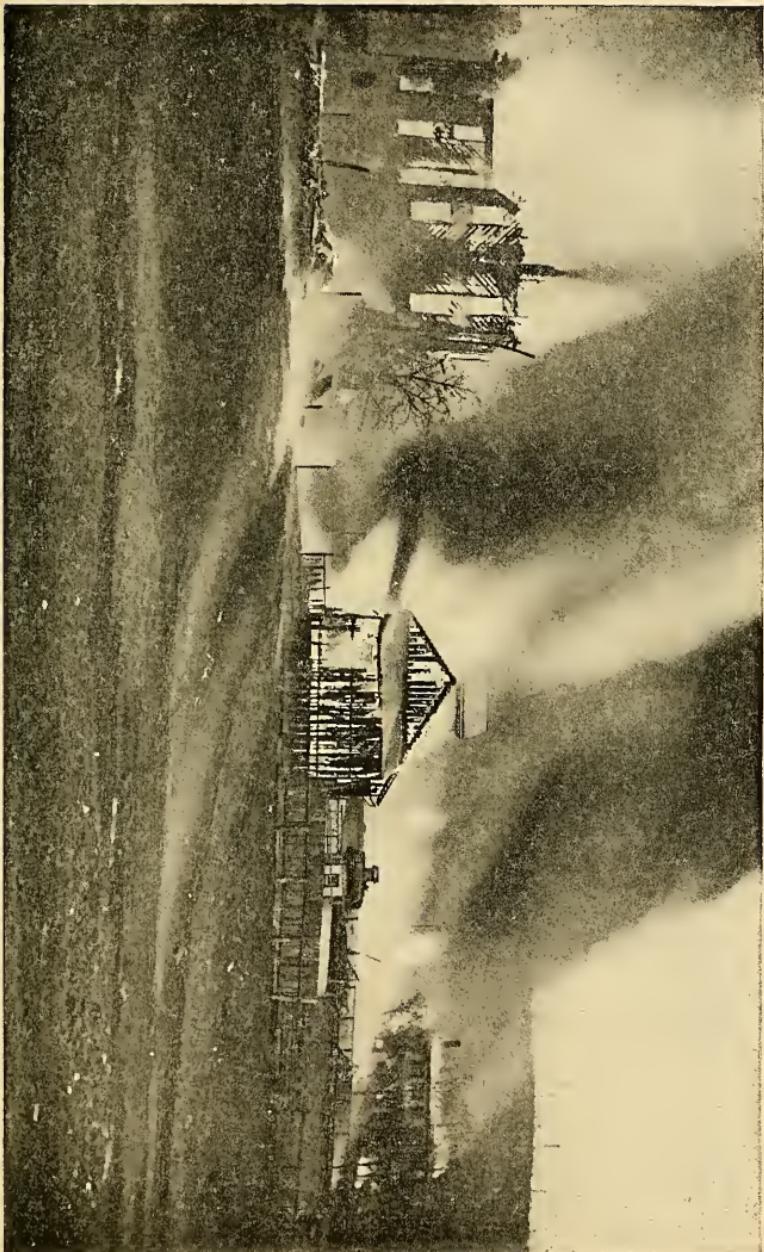
"SNYDER, WHITE AS A GHOST, RACED AHEAD OF THE FIRE."

out of this fire fountain came a smoking fire river, that rolled down the hill toward the village.

At this moment, Joe Snyder, who had not gone to the dance the night before, and was doomed now to the early worm's fate, had just put his key in the door of the butcher-shop. He never turned the key, nor saw it again, nor saw the butcher-shop again. What he did see was a roaring torrent of oil sweeping down the street and blazing fifteen feet high as it came. And the picture next presented when Snyder, white as a ghost, raced down the sidewalk ahead of the fire, will stay long in the memory of those who saw it from their windows.

But this was no time for looking at pictures out of windows; there were other things to be done, and done quickly. Never did fire descend so swiftly upon a village. Even as the startled sleepers stared in fright, houses all about them burst into flames like candles on a Christmas tree. Now the warehouse is burning, and the sheds across the tracks; and there goes the hardware store; and there goes the carpenter's shop; and now the fire-stream rolls through Main Street, and licks up the Reeves house on one corner and Vliet's store on the other. Then the drug-store goes, and Carling's store and Rinehart's restaurant. Trees are burning, fences are burning, the very streets are burning, and men see fire rolling across their front yards like drifting snow.

I do not purpose to follow the incidents of this fire and the several explosions, nor show how the village fought against it vainly, damming up fiery oil-streams and turning their courses, toiling at bucket-lines, and spreading blistering walls with soaked carpets. The point is that these efforts alone would never have availed, and Glen Gardner would speedily have lain



"THE VERY STREETS ARE BURNING."

in ashes, had not fire-engines from Sommerville and Washington been hurried to the spot. And even as it was, a section of the village was wiped away in clean-licked ruins, which stood for many a day as a grim reminder that the only safety against fires in these times lies in being able to fight fires well.

Which brings me, of course, to the modern fire department and the men who risk their lives as a matter of daily routine to protect their fellow-men. I will begin with some incidents of one particular fire that happened in New York on St. Patrick's Day, 1899. It was a pleasant afternoon, and Fifth Avenue was crowded with people gathered to watch the parade. A gayer, pleasanter scene it would have been hard to find at three o'clock, or a sadder one at four.

The Ancient Order of Hibernians, coming along with bands and banners, were nearing Forty-sixth Street, when suddenly there sounded hoarse shouts and the angry clang of fire-gongs, and down Forty-seventh Street came Hook and Ladder 4 on a dead run, and swung into Fifth Avenue straight at the pompous Hibernians, who immediately became badly scared Irishmen and took to their heels. But the big ladders went no farther. They were needed here, oh, so badly needed; for the Windsor Hotel was on fire—the famous Windsor Hotel at Fifth Avenue and Forty-seventh Street. It was on fire, far gone with fire before ever the engines were called; and the reason was that everybody supposed that of course *somebody* had sent the alarm. And so they all watched the fire, and waited for the engines, ten, fifteen minutes, and by that time a great column of flame was roaring up the elevator-shaft, and people on the roof, in their madness, were jumping down to the street. Then some sane citizen went to a fire-box and rang the call, and within

ninety seconds Engine 65 was on the ground. And after her came Engines 54 and 21. But there was no making up that lost fifteen minutes. The fire had things in its teeth now, and three, four, five alarms went out in quick succession. Twenty-three engines had their streams on that fire in almost as many minutes. And the big fire-tower came from Thirty-sixth Street and Ninth Avenue, and six hook-and-ladder companies came.

Let us watch Hook and Ladder 21 for a moment. She was the mate of the fire-tower, and the rush of her galloping horses was echoing up the avenue just as Battalion Chief John Binns made out a woman in a seventh-story window on the Forty-sixth Street side, where the fire was raging fiercely. The woman was holding a little dog in her arms, and it looked as if she was going to jump. The chief waved her to stay where she was, and, running toward 21 as she plunged along, motioned toward Forty-sixth Street. Whereupon the tiller-man at his back wheel did a pretty piece of steering, and even as they swung the long truck in the turn the crew began hoisting the big ladder. Such a thing is never done, for the swaying of that ten-ton mass might easily upset the truck; but every second counted here, and they took the chance.

As they drew along the curb, Fireman McDermott sprang up the slowly rising ladder, and two men came behind with scaling-ladders, for they saw that the main ladder would never reach the woman. Five stories is what it did reach, and then McDermott, standing on the top round, smashed one of the scaling-ladders through a sixth-story window, and climbed on, smashed the second scaling-ladder through a seventh-story window, and five seconds later had the woman in his arms.



USE OF THE SCALING LADDERS.

To carry a woman down the front of a burning building on scaling-ladders is a matter of regular routine for a fireman, like jumping from a fourth story down to a net, or making a bridge of his body. It is part of the business. But to have one foot in the air reaching for the lower rung of a swaying, flimsy thing, and to feel another rung break under you and your struggling burden, and to fall two feet and catch safely, that is a thing not every fireman could do; but McDermott did it, and he brought the woman unharmed to the ground—and the dog, too.

Almost at the same moment, the crowd on Forty-seventh Street thrilled in admiration of a rescue feat even more perilous. On the roof, screaming in terror, was Kate Flannigan, a servant, swaying over the cornice, on the point of throwing herself down. Then out of a top-floor window crept a little fireman, and stood on the fire-escape, gasping for air. Then he reached in and dragged out an unconscious woman and lowered her to others, and was just starting down himself when yells from the street made him look up, and he saw Kate Flannigan. She was ten feet above him, and he had no means of reaching her.

The crowd watched anxiously, and saw the little fireman lean back over the fire-escape, saw him motion and shout something to the woman. And then she crept over the cornice edge, hung by her hands for a second, and dropped into the fireman's arms. It is n't every big strong man who could catch a sizable woman in a fall like that and hold her, but this stripling did it, because he had the nerve and knew how. And that made another life saved.

By this time flames were breaking out of every story from street to roof. It seemed impossible to go on with the rescue work; yet the men persisted, even

on the Fifth Avenue front, bare of fire-escapes. They used the long extension ladders as far as they could, and then "scaled it" from window to window. Here it was that William Clark of Hook and Ladder 7 made the rescues that gave him the Bennett medal—took three women out of seventh-story windows when it was like climbing over furnace mouths to get there. And one of these women he reached only by working his way along narrow stone ledges for three windows, and back the same way to his ladder with the woman on his shoulders. Even so it is likely he would have failed in this last effort had not Edward Ford come part way along the ledges to meet and help him.

Meantime Fireman Kennedy of Engine 23 had rescued an old lady from the sixth floor; and Joseph Kratchovil of Hook and Ladder 2 had carried out Mrs. Leland, wife of the proprietor, from deadly peril on the fifth floor; and Frank Tissier of Hook and Ladder 4 had found a family named Wells—father, mother, and daughter—in a blazing room, and borne them out, with his own clothes burning, to the arms of Brennan and Sweeney, who were waiting for him in a fury of fire at the top of the eighty-five-foot extension ladder.

And Andrew Fitzgerald, also of Hook and Ladder 4, but off on sick-leave with pneumonia, had shown the true fireman spirit as he came from the doctors. His instructions were to go home and stay there. He was not on duty at all. He was scarcely strong enough to be out of bed, but when he heard that there were lives in peril down the avenue he forgot everything, and ran to the place of danger. There was need of him here, and, sick-leave or not, pneumonia or not, he would do what he could. What he did was to carry out the last ones taken alive from the ill-fated hotel—

three women whom he bore in his arms from the fourth floor through roaring hallways, then up a fire-escape, then back into the building, with the flames singeing him, and a shattering blast of exploding gas pursuing him, and finally out on a balcony whence, with the help of Policeman Harrigan, he got them over safely to an adjoining housetop. No wonder the Bonner medal was awarded him later for conspicuous courage.

II

WHAT BILL BROWN DID IN THE GREAT TARRANT FIRE

THE great test for Fire-engine 29 and her crew, the test of life or death that firemen wait years for (to see what stuff is in them), came of a mild autumn afternoon, not soon to be forgotten by men who lunch down City Hall way, by men who swarm in the stone hives of Chambers Street and Greenwich Street and Washington Street. This was the day when innocent, wholesome chlorate of potash (excellent for colds) showed what it can do when you take it by the ton with a pinch of fire. This was the day of the great explosions, when it rained red-hot stones and blazing timbers, when whole blocks of lower Manhattan shivered with the concussion. This was Tarrant's day, October 29, 1900.

It all started smoothly enough, with brass gongs tapping out deliberate 62's, at which the big horses in most engine-houses stamped their displeasure, for 62 meant nothing to them—at least not on the first call. But it was great business for Harry and Nigger and Baby, the two blacks and the gray that pull old 29, and there they were at the first tap, breasting the rubber-bound stall chains as if to hurry up laggard electricity, which presently shot its sparks and loosed their fastenings.

Now, down drop the stall chains, and the horses, pounding over the tiles, crowd up three abreast ahead

of the engine. Down drop the crew, silently, swiftly, sliding from ceiling to floor like so many blue-shirted ghosts. And click, click, its traces up and collars off the frames, and snap, snap, until the last hook holds.

"H'm," says Baby, as the thick wheels start, "six seconds; might have been worse."

"We 'll strike the curb in eight and a half!" snorts Nigger, as the doors swing wide and they bang into Chambers Street.

Out into Chambers Street they go, with Johnnie Marks driving and Bill Brown jamming blazing waste into her fire-box, where wood and oil do the rest. On the back steps rides Captain Devanny, steadyng himself by the coal-box, scowling under his helmet, and jerking fast on the alarm-cord as they swing into Greenwich Street. There is the fire just ahead, corner of Warren Street, nasty black smoke choking back the crowd. And here comes the hose-wagon, clangng and rumbling at their heels.

"It 's first water for us, Bill," said Devanny.

"There 's drugs and stuff in there," said Bill.

Then they fell to work—as firemen do.

"When the first explosion came," said Captain Devanny, telling the story weeks afterward, "I was inside the building, up one flight, at the bottom of a well of fire. McArthur and Buckley were with me, playing a stiff stream to protect the back windows. There 's where people in the building had to run to, men and girls; we could see 'em crowding on the balconies over Bishop's Alley, and we wanted to give 'em a chance on the fire-escapes. You see, a red-hot ladder is n't much use to anybody."

"Well, they got down, every soul of 'em, but by that time big chunks of fire were dropping all around us, and our helmets were crumpling and our clothes



A HOT PLACE.

were burning. Besides that, we kept hearing little explosions overhead, louder than the fire crackle, louder than pistol shots, and when you hear those in a drug-house you don't feel any too good. I went to the front, and saw fire breaking out everywhere on the fourth and fifth floors. Then I knew it was all up, and ran back to order the boys out. On the stairs I met Gillon, and was just yelling, 'Save yourselves!' when the crash came. It was like cannon, sir, and sounded *bssssssss* in my ears for a long time, as I lay in the wreck, with tongues of blue flames licking down over me. I'd been blown clean off the second-floor landing and dropped in the hallway, twenty feet back from the door. McArthur and Gillon were down the elevator shaft, where they'd jumped. Nobody dared lift a head, for a cyclone of fire was all over us."

It is not my purpose to detail the sufferings and final rescue of these flame-bound men. They had some vivid glimpses of death and some cruel burns, but firemen count these nothing, nor is McArthur's act in turning back through fire to save a fallen comrade (Merron) more than ordinary fireman's pluck, nor is Devanny's experience when caught in the second explosion and blown through a shop on Washington Street more than an ordinary hazard of the business. Indeed, this Tarrant fire should have but little of my attention were there not something in it beyond noise and house-smashing. There was this thing in it, overlooked by newspaper reports, yet vastly important, the behavior of Bill Brown, to whom, as a representative, one may say, of engine crew 29, came the great test I spoke of, the rare test which nothing but the highest courage can satisfy. All firemen have courage, but it cannot be known until the test how many have this particular kind—Bill Brown's kind.

And the odd part of it is that what he did seems a little thing, and it took only a minute to do, and it saved no life and made no difference whatever in the outcome of the fire, yet to the few who know—or care—it stands in the memories of the department as a fine and unusual bit of heroism.

What happened was this: Engine 29, pumping and pounding her prettiest, stood at the northwest corner of Greenwich and Warren streets, so close to the blazing drug-house that Driver Marks thought it was n't safe there for the three horses, and led them away. That was fortunate, but it left Brown alone, right against the cheek of the fire, watching his boiler, stoking in coal, keeping his steam-gage at 75. As the fire gained chunks of red-hot sandstone began to smash down on the engine. Brown ran his pressure up to 80, and watched the door anxiously where the boys had gone in.

Then the explosion came, and a blue flame, wide as a house, curled its tongues half-way across the street, enwrapping engine and man, setting fire to the elevated railway station overhead, or such wreck of it as the shock had left. Bill Brown stood by his engine, with a wall of fire before him and a sheet of fire above him. He heard quick footsteps on the pavements, and voices, that grew fainter and fainter, crying: "Run for your lives!" He heard the hose-wagon horses somewhere back in the smoke go plunging away, mad with fright and their burns. He was alone with the fire, and the skin was hanging in shreds on his hands, face, and neck. Only a fireman knows how one blast of flame can shrivel up a man, and the pain over the bared surfaces was—well, there is no pain worse than that of fire scorching in upon the quick flesh seared by fire.

Here, I think, was a crisis to make a very brave man quail. Bill Brown knew perfectly well why every one was running; there was going to be another explosion in a couple of minutes, maybe sooner, out of this hell in front of him. And the order had come for every man to save himself, and every man had done it, except the lads inside. And the question was, Should he run or should he stay and die? It was tolerably certain that he would die if he stayed. On the other hand, the boys of old 29 were in there. Devanny and McArthur, and Gillon and Merron, his friends, his chums: he 'd seen them drag the hose in through that door—there it was now, a long, throbbing snake of it—and they had n't come out. Perhaps they were dead. Yes, but perhaps they were n't. If they were alive, they needed water now more than they ever needed anything before. And they could n't get water if he quit his engine.

Bill Brown pondered this a long time, perhaps four seconds; then he fell to stoking in coal, and he screwed her up another notch, and he eased her running parts with the oiler. Explosion or not, pain or not, alone or not, he was going to stay and make that engine hum. He had done the greatest thing a man can do—had offered his life for his friends.

It is pleasant to know that this sacrifice was averted. A quarter of a minute or so before the second and terrible explosion, Devanny and his men came staggering from the building. Then it was that Merron fell, and McArthur checked his flight to save him. Then it was, but not until then, that Bill Brown left Engine 29 to her fate (she was crushed by the falling walls), and ran for his life with his comrades. He had waited for them, he had stood the great test.

It were easy to multiply stories of the firemen,

stories of the captains, stories of the chiefs—there is no end to them. However many may be told or written, they are but fragments of fragments. New York has one hundred and thirty-six engine companies, forty hook-and-ladder companies, besides the volunteers on Staten Island, and there is not one of these but has its proud record of courage and self-sacrifice. Other lives show bravery for gain, bravery for show, bravery for sport; these show bravery for the public good and for no other reason—unselfish bravery. Think what the firemen do! They give up regular sleep, they give up home life, they bear every exposure, they face death in many forms as a matter of daily routine, they never refuse an order, lead where it may (such a case is practically unknown), and they do all this for modest pay and scant glory. Three or four dollars a day will cover their earnings, and as for the glory, what is it? For some a medal, a tattered paper with roll-of-honor mention, a picture in the newspapers; for most of them nothing. Yet they are cheerful, happy men. Why? I have wondered about this.

Shall we think of firemen as braver than other men, as finer or more devoted? No and yes. I should say that most of them, to start with, had no such superiority, but came into the department (usually by opportunity or drift) out of unpromising conditions, came in quite as selfish and timorous, quite as human as the ordinary citizens. And the life did the rest. The life changed them, made them braver and better. Why? Because it is a brave, unselfish life, and no man can resist it. Put a convict in the fire department and he will become an honest man—or leave. It's like changing scamps into heroes on the battle-field, only these battles of hose and ax are all righteous battles to save life, to avert loss and suffering. In the

whole business of fighting fires there is no place for a mean or a base motive, and can be none. Therefore, meanness and baseness go out of fashion just as whining goes out of fashion on a football team. It 's the fashion among firemen to do fine things.

Let me give a further instance to show what this fire department fashion does for men at the very top—for battalion chiefs and deputy chiefs and the chief himself. It swings them into line like men in the ranks. With the chance to work less, they find themselves working harder. With orders to take from no one, they assume voluntarily a severer duty than any man would put upon them. And this even if power has come through the way of politics, through influence or scheming. Let the most spoils-soaked veteran become chief of a city fire department and I believe we should see him, in spite of himself, forgetting his pocket-stuffing principles, and seeking the heroic goal, though it kill him. Which it probably would. As a matter of fact, New York has never had a chief who did not work harder than his men, and spare himself less than he spared his men.

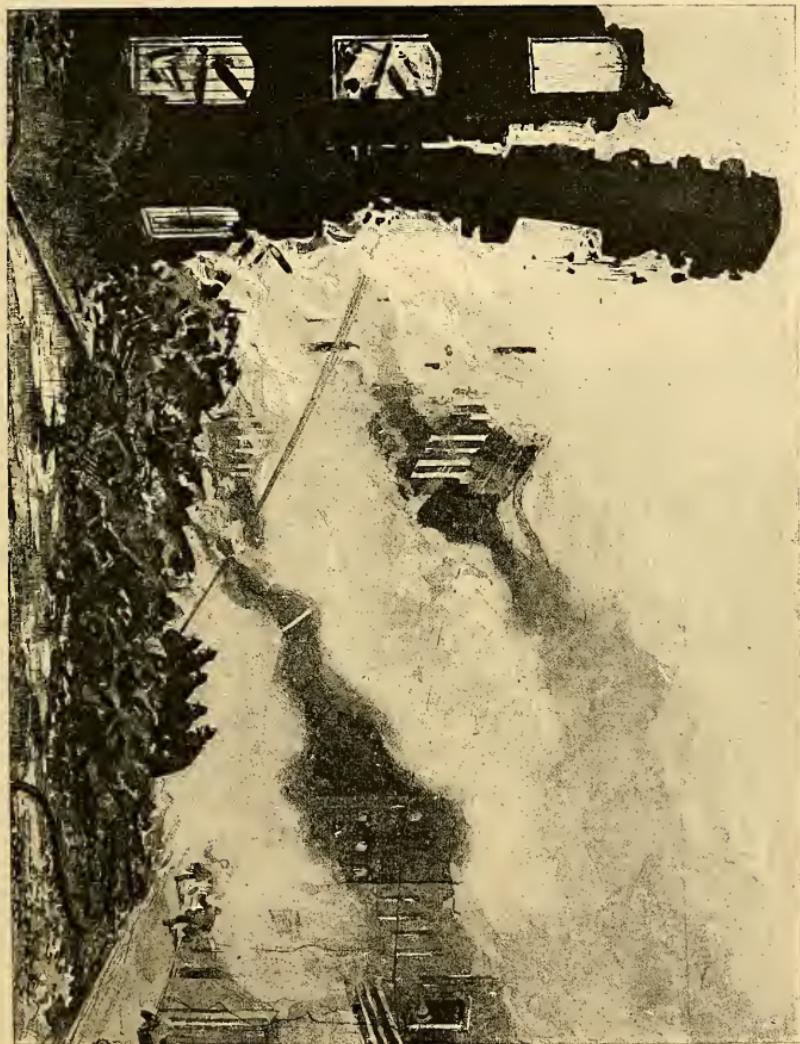
Take our present chief, Edward F. Croker, the youngest man who ever held this place. Let me run over his twenty-four hours, from eight in the evening, when he goes on night duty at the Great Jones Street engine-house. From now until daylight he will cover personally some two hundred stations on the first alarm—that is, everything from Twenty-third Street to the Battery, the region of greatest danger. And on the second or third alarm he will cover the whole of Manhattan Island. That means answering every night from two to a dozen calls scattered over a great area. It means a pair of horses (Dan and John, usually) and driver clean worn out when morning comes. And

it means to the chief, besides physical fatigue, an exhausting responsibility in quickly judging each fire and outlining the way of fighting it.

Almost a day's work this, one would say, but it is only a beginning. However broken his rest, the chief is up at seven in the morning—and note that what sleep he gets, three, four, five hours, is at an engine-house, not at his home—and by nine he is at headquarters, in Sixty-seventh Street, ready for a hard morning transacting business for the department, doing as much work as a merchant in his counting-room. This until one o'clock.

Then no luncheon (all fire chiefs are two-meal men), but off for a four-hours' spin behind Kitty and Belle, his daylight team, driving from station to station for the work of inspection, holding the reins himself for arm exercise, seeing with his own eyes how the work is going, holding every man to his duty. Studying the city, too, as he goes about, noting its growth and changes from the view-point of a fire expert, detecting weak points, bad streets, defective structures, fixing in mind the danger spots, here oil, there lumber, yonder paint or chemicals, and planning always for the defense.

After this inspection tour comes the only time in the day when the chief is not on duty, an hour and a half or two hours, when he gets a glimpse of his family and eats his dinner. Even then the fire buggy waits outside, and many a time this brief home stay is cut short and off goes the chief, dropping knife and fork, to answer a third alarm. There is some perversity about fires, so his wife and children think, that makes more of them start between six and eight in the evening (this is really a fact) than at any other period of the day.



A FALLING WALL.

So here we have a chief who actually holds himself ready for hardest service twenty-two hours in every twenty-four, who seldom knows a night's unbroken rest, who never takes a day off—not even Sundays or holidays, but uses these for longer inspection tours, driving forty or fifty miles of a Christmas day over Long Island or out into Queens County, or up through the Westchester region.

And he is never ill, and he never complains!

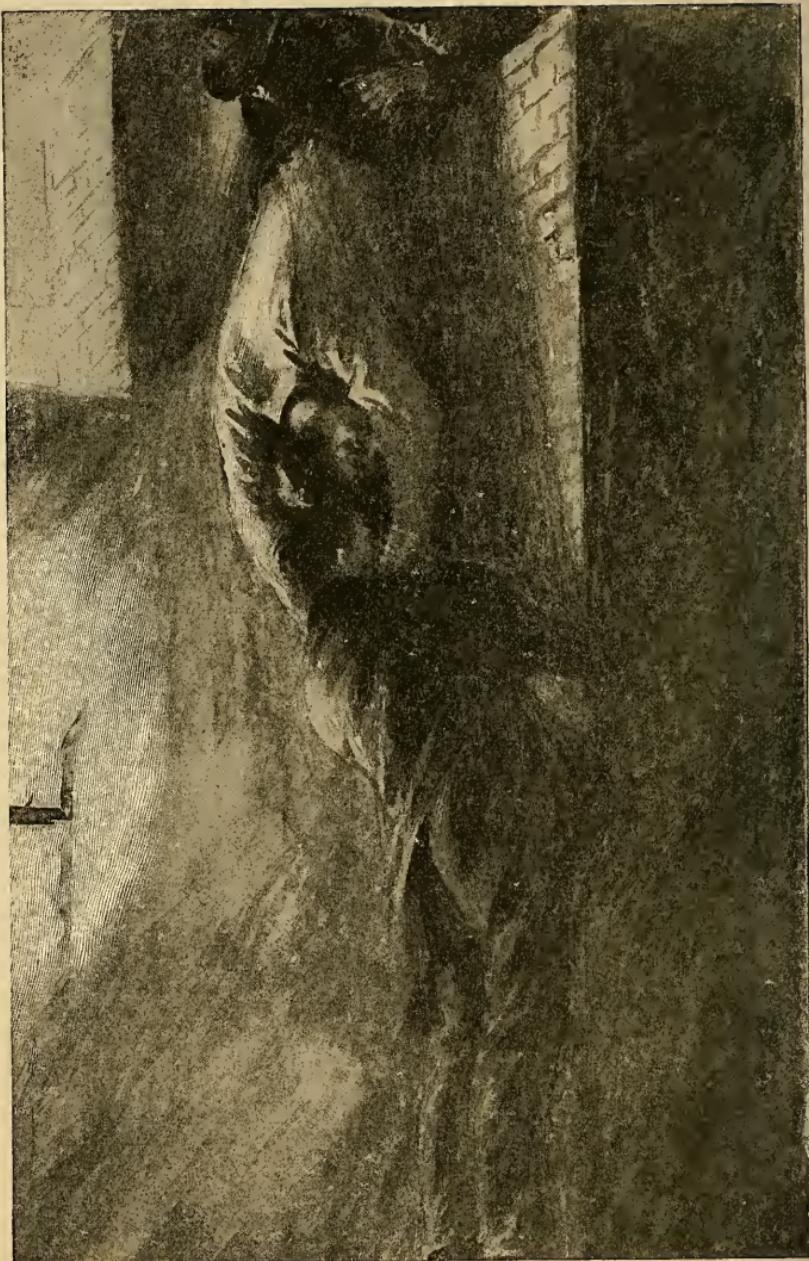
To watch the chief at a big fire is a thing worth doing, though not easy to do, for he moves about constantly, up-stairs and down-stairs, from roof to roof, from engine to engine, in danger like his men, not sending his orders merely, but following after to observe their execution. "I expect each of my captains," he told me one day, "to know the location and general condition of every alleyway, every stairway, every hydrant, every fire-escape in his section. When I get to a fire the captain must tell me what I want to know, and do it quick. Will we find water in there behind the smoke? Is there a back door at the end of that passage? How about the balconies? Where does this lane between the houses come out? And a dozen other things. If you want to fight fires well you must know the ground as if you lived on it."

III

HERE WE VISIT AN ENGINE-HOUSE AT NIGHT AND CHAT WITH THE DRIVER

THERE is something strange and solemn about an engine-house at night, like the stillness of a church or the hush of a drowsing menagerie. You are filled with a sense of impending danger, which is symbolized everywhere: in the boots ranged at bunksides of sighing sleepers, in the brass columns, smooth as glass, that reach up through manholes in the floor, and at which the fire crew leap, half drunk with fatigue; in the engine, purring at the double doors (steam always at 25 in the boiler), with tongues and harness lifted for the spring; in the big gong which watches under the clock (and the clock watches, too), a tireless yellow eye, that seems to be ever saying, "Shall I strike? Shall I strike?" And the clock ticks back, "Wait, wait," or "Now, now." That is what you feel chiefly in an engine-house at night—the intense, quiet watchfulness. Even the horses seem to be watching with the corner of an eye as they munch their feed.

I counsel a man, perhaps a woman, weary of the old evening things, the stupid show, the trivial talk, the laughter without mirth, the suppers without nourishment, to try an hour or two at an engine-house, making friends with the fireman on guard (it may be the driver of a chief, as happened to me), and see if he does n't walk back home with a gladder heart and a



A RESCUE FROM A FIFTH STORY.

better opinion of his fellows. I fancy some of our reformers, even, might visit an engine-house with profit, and learn to dwell occasionally on the *good* that is in our cities and learn something about fighting without bluster and without ever letting up.

It was a tall, loose-jointed fellow I met at the Elm Street station, a typical down-easter, who had wandered over the world, and finally settled down as driver of the nervous little wagon that carries Chief Ahearn, a daring man and famous, in his dashes from fire to fire over the city. In these days of idol-breaking it is good to see such hero worship as one finds here for all men who deserve it, whether in humble station or near the top, like this wiry little chief, asleep now up-stairs against the night's emergencies. Ask any fireman in New York to tell you about Ahearn, and you 'll find there is one business where jealousy does n't rule. Ahearn? What do they think of Ahearn? Why, he 's a wonder, sir; he 's the dandiest man. Say, did ye ever hear how he crawled under that blazing naphtha tank and got a man out who was in there unconscious? They gave him the Bennett medal for that. And d' ye know about the rescue he made up in Williamsbridge, when that barrel of kerosene exploded? Oh, but the prettiest thing Ahearn ever did was—Then each man will tell you a different thing.

The driver's favorite story was of the night when Ahearn ran back into a burning tenement on Delancey Street, "where nobody had any business to go, sir, the fire was that fierce." It was fine to see his face light up as he told what his chief did on this occasion, and the whole quiet engine-house seemed to throb with pride.

"You see," he went on, "there was a half-crazy mother screaming around that her baby was in the

building. As a matter of fact, the baby was all right—some neighbors had it—but the mother did n't know that, and the chief did n't know it, either. He was chief of the 4th Battalion then; now he 's deputy chief—been promoted, y' know. Chief or not did n't cut any ice with him, and he just wrapped a coat around his head and went in. He got to the room all right where the woman said her baby was, and it was like a furnace; so he did the only thing a man can do—got down low on his hands and knees and worked along toward the bed, with his mouth against the floor, sucking in air. He went through fire, sir, that nearly burned his head off—it did burn off the rims of his ears—but he got to that bed somehow, and then he found he 'd done it all for nothing. There was n't any baby there to save.

"But there was a chief to save now. He was about gone when he got back to the door, and there he found that a spring-lock had snapped shut on him, and he was a prisoner, sir—a prisoner in a stove. He did n't have any strength left, poor old chief; he could n't breathe, let alone batter down doors, and we 'd had some choice mourning around here inside of a minute if the lads of Hook and Ladder 18 had n't smashed in after him. They thought he 'd looked for that baby about long enough. The last thing he did was to kick his foot through a panel, and they found him there unconscious, with his rubber boot sticking out into the hall.

"Tell ye another thing the chief did," continued the driver. "He rescued a husband and wife in the Hotel Jefferson, out of a seventh-story window, when the whole business was roaring with fire. That 's only about a month ago; it was a mighty sad case. We had three people to save, if we could, and two of 'em sick—

the husband and wife—and the third was a trained nurse taking care of 'em. Shows how people get rattled in a fire. Why, if they 'd only kept their hall door shut—well, they did n't, and there they were, all three at the window, without hardly any clothes on, and the flames close behind 'em.

"We got up on the top floor of the Union Square Hotel, the chief and I, about ten feet away along the same wall, and by leaning out of our windows we could tell 'em what to do. It was a case of ropes and swing across to us, but it is n't every man can make a rope fast right when a fire is hurrying him, especially a sick man, or mebbe it was a poor rope he had. Anyhow, when the nurse came out of that window, you might say tumbled out (you see, they made her go first), she just fell like that much dead weight, scared, you know, and when the rope tightened it snapped, and down she went, seven stories—killed her bang.

"The chief saw that would never do, so we went up on the roof and threw over more rope. It was clothesline, the only thing handy, but I doubled it to make sure. And with that we got the husband and wife across all safe, for now, you see, we could lift 'em out easy, without such a terrible jerk on the rope. That was the chief's idea."

"Yes," said I, "but you helped. What 's your name?"

"No, no," he smiled; "never mind me. I 'm nobody. Let the chief have it all." And then he went on with the story, which interested me mainly as showing the kind of loyalty one finds among these firemen. Each man will tell of another man's achievements, not of his own. You could never find out what Bill Brown did from Brown himself.

The clock ticked on, some service calls rang on the telephone, and once the driver bounded up in the middle of a word and stood with coat half off, in strained attention, counting the strokes of the gong. No, it was n't for them. They 'd go, though, on the second call. Second calls usually came within twenty minutes of the first, so we 'd soon see. Meantime, he told me about a fireman known as "Crazy" Banta.

"Talk about daredevils!" said he, "this man Banta beat the town. Why, I 've known him to go up on a house with a line of men where they had to cross the ridge of a slate roof—you know, where the two sides slant up to a point. Well, the other men would straddle along careful, one leg on each side, but when Banta came he 'd walk across straight up, just like he was down on the street. That 's why we called him 'Crazy'—he 'd do such crazy things.

"And funny? Well, sir, he 'd swaller quarters as fast as you 'd give 'em to him, and let you punch him in the stomach and hear 'em rattle around. Then he 'd light a match, open his mouth, put the match 'way inside, and let you watch the quarters come up again. Had a double stomach, or something. He could swaller canes, too, same as a circus man. Said he 'd learned all his tricks over in India, but some of the boys thought he lied. They said he 'd prob'ly traveled with some show. He used to tell us how he could speak Burmese and Siamese and Hindu, all those lin-goes, just perfect; so one day a battalion chief called his bluff when there were a lot of emigrants from those parts down at the Battery, and blamed if Banta did n't chin away to the whole crowd of 'em; you 'd thought he was their long-lost brother. Was he a foreigner? No, sir; he was born in Hohokus, N. J.

"But the time Banta fixed his reputation all right



AT FULL SPEED.

was at a fire in Pell Street—some factory. After that he might have told us he could fly or eat glass or any old thing, and we 'd have believed him. Tell ye what he did. This factory all smashed in after she 'd burned a while, and one of the boys—Dave Soden—got wedged under the second floor, with all the other floors piled on top of him. It was a great big criss-cross of timbers, with Dave at the bottom, and the flames eating in fast. We could see the whole thing was going to make a fine bonfire in about three minutes, and it looked as if Dave would be in it.

"You understand, we did n't dare pry up the timbers, for that would have brought the whole factory down on Dave and killed him plumb. And we could n't begin at the top and throw off the timbers, for there was n't any time. We did n't know what to do, but Banta he did. He grabbed up a saw, and said he 'd crawl in and get Dave out. And, by thunder! he did. He just wriggled in and out like a snake through those timbers, and when he got to Dave he sawed off the end of a beam that held him and then dragged him out. He took big chances, for, you see, if he 'd sawed off the wrong beam it might have brought down the whole business on both of them. But Banta he knew how to do it. Oh, he was a wonder! They gave him the medal for that, and promoted him. Say, you 'd never guess how he ended up?"

"How?" I asked.

"Got hit by a cable-car; yes, sir. Hurt so bad they retired him. What d' ye think of that? Not afraid of the devil, and done up by a measly cable-car!"

IV

FAMOUS RESCUES BY NEW YORK FIRE-BOATS FROM RED-HOT OCEAN LINERS

AFTER all has been said that may be about our admirable fire-engines, and endless stories have been told of gallant fights made by the engine lads for life and property, there remains this fact: that New York possesses a far more formidable weapon against fires than the plucky little "steamers" that go clanging and tooting about our streets. The fire-boat is as much superior to the familiar fire-engine as a rapid-fire cannon is superior to a rifle. A single fire-boat like the *New-Yorker* will throw as much water in a given time as twenty ordinary fire-engines: it will throw twelve thousand gallons in a minute—that is, fifty tons; or, if we imagine this great quantity of water changed into a rope of ice, say an inch thick, it would reach twenty miles.

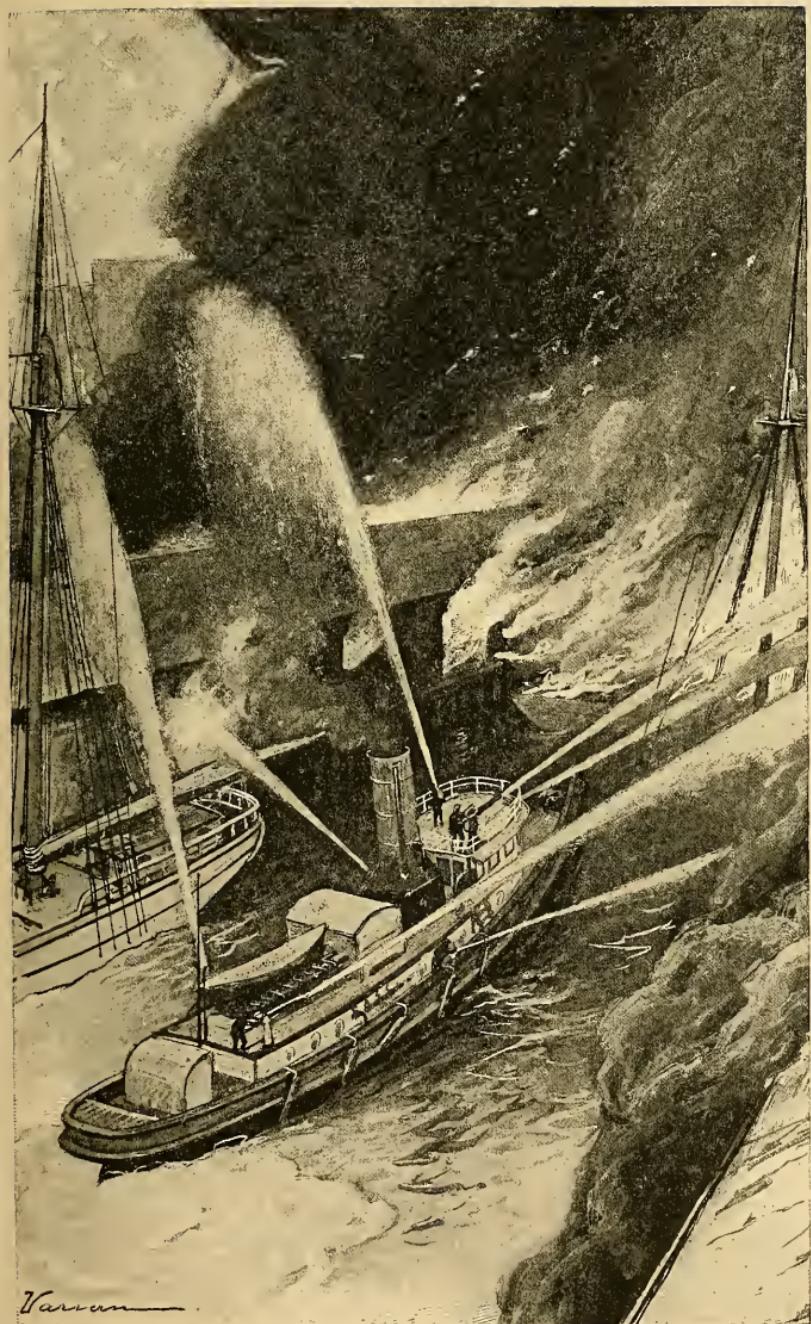
Suppose we go aboard her now, this admirable *New-Yorker*, and look about a little. People come a long way to see her, for she 's the largest and finest fire-boat in the world. Pretty, is n't she? All brass and hard wood and electric lights, everything shining like a pleasure-yacht. Looks like a gunboat with rows of cannon all around her—queer, stumpy little cannon, that have wheels above their mouths. Those are hose connections, like hydrants in a city, where they screw fast the rubber lines. She has twenty-one on a side; that makes forty-two "gates," as the engineer calls

them, without counting four monitors aloft—those things on the pilot-house that look like telescopes with long red tails. It was the monitors, especially “Big Daddy,” that did such great work against those North German Lloyders, in their drift down the river, in 1900, with decks ablaze and red-hot iron hulls. We shall hear all about that day if we sit us down quietly in the fire quarters ashore and get the crew started.

Stepping over-side again, here we are in the home of the fire-boat crew. It’s more like a club than an engine-house. No horses stamping about, no stable; but pictures on the walls, and men playing cribbage or reading, and nobody in a hurry. Plenty of time for tales of adventure, unless that gong takes to tapping.

And here comes Gallagher, sliding down yonder brass column from the sleeping-rooms. He’s the lad who did fine things in that great fire at the Mallory pier—saved a man’s life and made the roll of honor by it. We’ll never get the story from him, but the other boys will tell us.

If ever fire-boats proved their value, it was that night in May, 1900, when Pier 19, East River, caught fire, with all its length of inflammable freight. Close to three o’clock in the morning it was, and a hurricane from the northeast was driving the flames toward land. Before the engines could start, a fire-wave had leaped across South Street and was raging down the block. And another fire-wave had leaped across the dock between Pier 19 and Pier 20, setting fire to a dozen barges and lighters moored there, and to the steamship *Neuces* of the Mallory line. And presently all these were blazing, some with cargoes of cotton and oil, blazing until the lower end of the island looked out of the night in ghastly illumination, a terrible picture in



Varian

"INTO THIS STREET OF FIRE, BETWEEN THE TWO PIERS, STEAMED THE BIG FIRE-BOAT, STRAIGHT IN, WITH FOUR STREAMS PLAYING TO PORT AND FOUR TO STARBOARD, ALL DOING THEIR PRETTIEST."

red and black. They say it was bright enough that night half a mile away for a man to pick up a pin.

There is no harder problem for the engines than these fierce-driven water-front fires that sweep in suddenly shoreward, for they must be taken head on, with all the smoke in the firemen's faces, and water often lacking, strange to say, although the river is so near. For the fire-boats, however, the advantage is the other way; they attack from the rear, where they see what they are doing, and can pump from a whole ocean. Besides that, they attack with so formidable a battery that no hook-and-ladder corps is needed to "break open" for them. The three-inch stream from Big Daddy alone will tear off roofs and rip out beams like the play of artillery; and if that is not sufficient, the boys have only to hitch on the four-and-a-half-inch nozzle and set the two pumps feeding it five thousand gallons a minute, or twenty tons of water. Under that shock there is no wall built of brick and mortar that will not crumble.

When the *New-Yorker* came up on this memorable night the fifth alarm had sounded and things were looking serious. Piers 19 and 20 were in full flame, and every floating thing between them. Into this street of fire steamed the big fire-boat, straight in, with four streams playing to port and four to starboard, all doing their prettiest. She went ahead slowly, fighting back the flames foot by foot, on pier and steamship and kindling small craft that drifted by in fiery procession. And the air in the men's faces was like the breath of a furnace!

Here it was that Gallagher won his place on the roll of honor in this wise. For some time they had heard shouts that were lost in the din of conflagration; but presently they made them out as a warning from



GALLAGHER'S RESCUE OF A SWEDE FROM THE BURNING BARGE.

somebody somewhere that a man was on a burning barge just passing them. It seemed incredible that a man could be there, alive and silent; but, with the spirit of his trade, Gallagher determined to see if it were true: he would board the barge anyhow; and as the *New-Yorker* swung close alongside, he sprang down to her deck, where things were a good deal warmer than is necessary for a man's health. And as he leaped, John Kerrigan, at the steering-wheel of Big Daddy, turned its mighty stream against the barge, keeping it just over Gallagher's head, so that the spray drenched down upon him while the stream itself smote a path ahead through the fire.

Down this path went Gallagher, searching for a man, avoiding pitfalls of smoke and treacherous timbers, confident that Kerrigan would hold the flames back, yet see to it that the terrible battering-ram of water did not strike him—for to be struck with the full force of Big Daddy's stream is like being pounded by a trip-hammer.

Gallagher reached the cabin door, found it locked, put his back against it and smashed it in. Then he went on, groping, choking, feeling his way, searching for his man. And at last on one of the bunks he found him, stretched out in a stupor of sleep or drowsed by the stifle of gases. The man was a Swede named Thomas Bund, and he came out of that cabin on Gallagher's back, came off that burning barge on Gallagher's back, and if he does not bless the name of Gallagher all his days, then there is no gratitude in Sweden.

Here we see the kind of service the fire-boats render. On this night they saved the situation and a million dollars besides; they worked against a blazing steamship, against blazing piers, against blazing runaways;

worked for eleven hours, until the last smolder of fire had been drowned under thirty thousand tons of water. And not a year passes but they do something of like sort. Now it is a steamship, say the ill-starred *Leona*, that comes up the bay with a cargo of cotton burning between decks. The *New-Yorker* makes short work of her. Again it is a blazing lumber district along the river, like the great *McClave* yards, where the fire-boats fought for eight days and nights before they gained the victory. But they *did* gain it. Or it may be a fire back from the river, like the *Tarrant* horror, where the land engines, sore pressed, welcome far-carried streams from the fire-boats as help that may turn the balance.

"Why, this fire-boat 's only ten years old, sir," said Captain Braisted, "and she 's saved more than she cost every year we 've had her." Then he added, as his eyes dwelt proudly on the trim craft purring at her dock-side: "And she cost a tidy sum, too."

Let us come now to that placid summer afternoon, to that terrible Saturday, June 30, 1900, when tug-boats in the North River looked upon a fire the like of which the river had never known and may not know again. They looked from a distance, we may be sure, these tug-boats; for when a great liner swings down-stream, a roaring, red-hot furnace, it is time for wooden-deck craft to scurry out of the way. And here were three liners in such case, the *Bremen*, the *Saale*, and the *Main*, all burning furiously and beyond human help, one would say, for their iron hulls were vast fire-traps, with port-holes too small for rescue, and the decks swept with flame. It was hard to know that back of those steep sides were men in anguish, held like prisoners in a fortress of glowing steel that sizzled as it drifted—three fortresses of glowing steel.

Then up steamed the *New-Yorker* and the *Van Wyck*, with men behind fire-shields against the blistering scorch and glare, with monitors and rail-pipes spurting out all that the pumps could send. The *New-Yorker* took the *Bremen*, the *Van Wyck* took the *Saale*; and there they lay for hours, close on the edge of the fire, like a pair of salamanders, engines throbbing, pumps pounding, pilots at the wheel watching every movement of the liners, following foot by foot, drawing in closer when they gained on the fire, holding away a shade when the fire gained on them, fighting every minute.

"It's queer," said Captain Braisted, "but when you play a broadside of heavy streams on a vessel's side, say at fifty feet, there's a strong recoil that keeps driving the fire-boat back. It's as if you were pushing off all the time with poles instead of water. And you have to keep closing in with the engines."

"How near did you get to the *Bremen*?" I asked.

"Oh, we finally got right up against her, say after forty-five minutes. You can cool off a lot of red-hot iron in forty-five minutes when you've got forty-five tons of water a minute to do it with."

It was just as they came alongside that one of the crew made out a human shape in the coal-chute some ten feet up the *Bremen*'s side. And presently they saw others there, blackened faces, fierce and fearful eyes. And above the fire crackle and the crash of water they heard men's cries.

Straightway a ladder was brought, and three of the crew, Breen, Kerrigan, and Hartmann, lifted it on their shoulders until the top rung came up level with the coal-chute. But this, instead of bringing relief to the fire-bound company, brought madness; for now they fought and struggled so, each one wishing to go

first, that none were able to go at all. "They were like wild beasts," said one of the crew.

In this crisis Gallagher sprang up the ladder to the top, where he could look in through the hole, the one hole in all the vessel's sides that was large enough for a man's body to pass. And reaching in here, he grabbed what was nearest, arm, leg, or shock of hair, and hauled it out and lowered it down the ladder to Captain Braisted, who stood below him and passed the bundle on. Then Gallagher grabbed again and again, pulling forth by sheer strength one man at a time, taking them as they came, Germans or Italians, officers or coal-handlers, anything that was alive. Down came the tumbling mass, yelling, praying, fighting, a miserable human stream; and when it was all over and the count was taken, they had saved thirty-two lives.

Now one of the rescued men spoke up in broken English, and said that there were others still on the *Bremen*, down in the engine-room. And Gallagher volunteered to go aboard for the rescue if one of the men who knew the vessel would come along to guide him. But no man offered this service. It was too hazardous a thing, they said; where the fire was not raging there was smoke and darkness, and the engine-room was far down in the vessel. They had groped about themselves for half an hour in despair, searching for the way out, and now that they had found it, they were not fools enough to go in again.

"But you say there are others in there alive!" insisted Gallagher.

The rescued ones shook their heads blankly at this; in their minds the law of self-preservation rode over all other things at this moment. Poor men, they were half dazed by their sufferings and the shock!



SAVING THE MEN OF THE "BREMEN."

"All right," cried Gallagher; "I 'll go in and find 'em without any guide. Hold the ladder, boys."

And up he went!

"I 'm with you, Ned," called Captain Braisted; and without more words these two climbed in through the coal-chute and started down the black, hot, stifling ways for the engine-room. And somehow they got there safely, and found eight men still alive, all Germans, engineers and their assistants. But when the firemen called to them to hurry out for their lives, they refused to move. Their duty was with their engines, said they; they had to run the engines; they were much obliged to the American gentlemen, but they could not leave their post.

Gallagher and Braisted could scarcely believe their ears.

"But you will die!" they urged.

The Germans thought it very likely; still they could not leave.

"But it won't do any good; the vessel is past hope; you will be burned to death."

The Germans understood perfectly: they would be burned to death at their engines; and as they were all of this mind and not to be shaken, the firemen could only say "good-by" and set forth sadly on the return journey. And this time they nearly lost themselves, but at last their good star prevailed, and they came without harm to their comrades, who listened in wonder to the news they brought. It seemed such utter folly, the decision of that unhappy engine-room crew, yet there was something almost splendid in their stubborn devotion to duty. Quietly they had looked death in the face, a horrible, lingering death, and had not flinched; and days later, when the steamer had burned herself out and lay grounded in the mud, cold and

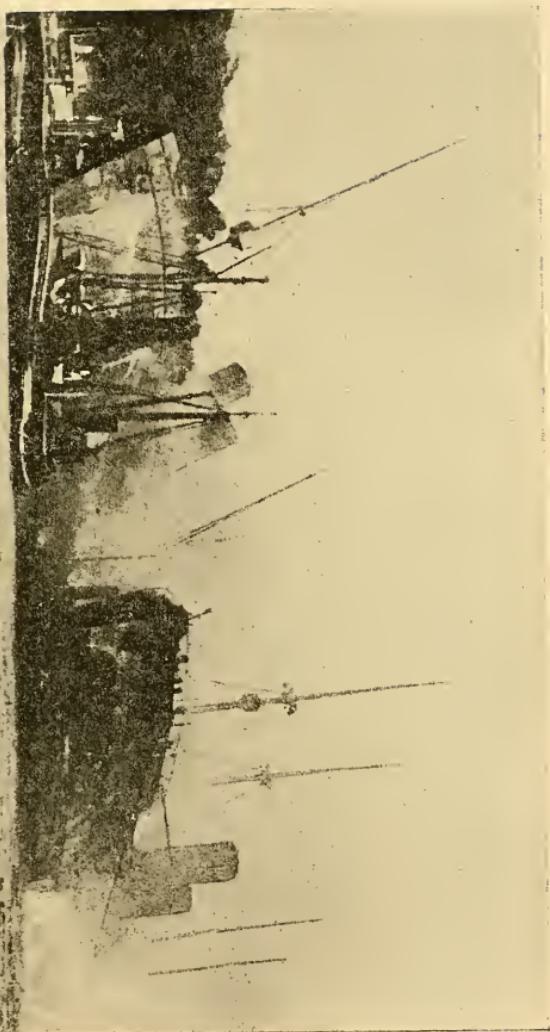
black, the wreckers found these faithful though mistaken men still at their posts, still by their engines, where they had waited in spite of everything—where they had perished.

All this time the *Van Wyck* had been working on the *Saale*, but in a harder fight, for the flames raged here as fiercely as on the *Bremen*, while the smaller fire-boat could throw against them only twenty-five tons of water a minute, which was not enough.

So, now, when all had been done that could be for the *Bremen*, orders came that the *New-Yorker*, too, turn her streams against the *Saale*, and a little later the two fire-boats were in massed attack upon the unhappy liner, which swung down the bay like a blazing island, and presently grounded by the bow on the Comminipaw mud-flats, and rested there for the last agony.

The story of those tragic hours is not for telling now. There were more heroic rescues. There were brave attempts at rescue that availed nothing. The fire lads stood on the hurricane deck, with flames roaring about them and water up to their knees surging past like a mill-race; it was the return torrent from their own nozzles. Foot by foot the stern settled and the water crept nearer, nearer to the open port-holes. In a large stateroom aft fourteen men and one woman gave a noble picture of resignation in the face of an awful death. Hemmed in there between fire and water, they prayed quietly, and thanked the fire lads for cups of water passed in through the port-hole, and waved "good-by" as the stern gave a final lurch and went down.

Nor does this end the record of that day, for there was still the *Main* to fight for, and at eleven o'clock that night the *New-Yorker* steamed up the river and caught the third liner as the flood-tide bore



FIRE-BOATS WORKING ON THE "BREMEN" AND THE "SAALE."

her stern first toward the flats of Weehawken. She had been blazing for eight hours, and was red-hot now from the water-line up. It seemed incredible that there could be a living thing aboard her, yet they went to work in the old way, and within an hour had dragged out through the coal-hole a blackened and frightened company, more than a score of boiler-cleaners and coal-handlers who had somehow lived through those fearful hours by burrowing down in the deepest bunkers far below the water-level.

After this the fire-boats did other things.

THE AÉRIAL ACROBAT

I

SHOWING THAT IT TAKES MORE THAN MUSCLE
AND SKILL TO WORK ON THE HIGH BARS

A FEW years ago I had the pleasure of traveling for ten days with a great circus, and in this way came to know some very interesting people—elephant-keepers, lion-tamers, trapeze performers, bareback riders, not to mention the bearded lady, the dog-faced boy, and other side-show celebrities who used to eat with us in the cook-tent—there was one gentleman, appareled in blue velvet, who ate with his feet, for the reason that he had no arms, and would reach across for salt or butter with an easy knee-and-ankle movement that was a perpetual surprise.

What strange things one sees traveling with a circus! Every night there is a mile of trains to be loaded, every morning a tented city to be built. Such hard work for everybody! Two performances a day, besides the street procession. And what a busy time in the tents! Leapers getting ready, double-somersault men getting ready, clowns stuffing out false stomachs and chalking their faces, kings of the air buckling on their spangles. *Ouf!* How glad we all were when five o'clock came, and the concert was over, and the "big top," with its spreading amphitheater and its four great center-poles, stood silent and empty!

It was at this five-o'clock hour one day that I first

saw little Nelson, the ten-year-old trapeze performer, and that picture remains among the pleasantest of my circus memories. I can recall more exciting things, like the fight between two jealous wrestlers, or the mystery of the lost Chinese giant, or the story of a wrecked train, when the wild animals escaped and the fat lady was rescued with difficulty from a burning car. And I can recall sad things, the case of that poor trapeze girl, two weeks a widow, who nevertheless went through her act twice a day and tripped away kissing her hands to the crowd while her heart was breaking. And saddest of all was the case of beautiful "Zazel," once the much-advertised "human cannon-ball," then suddenly a helpless cripple after a fall from the dome of the tent. Her husband, one of the circus men, told me how she lived for more than a year in a plaster case swung down from the ceiling, and of her sweetness and patience through it all. And she finally recovered, I am glad to say, so that she could walk—a pale, weak image of this once splendid circus queen.

But let me come to Nelson. This sturdy little fellow was one of the circus children, "born on the sawdust," brought up to regard lion cages as the proper background for a nursery, and thinking of father and mother in connection with the flying bars and bare-back feats. It was Nelson's ambition to follow in his father's steps and become a great artist on the trapeze. Indeed, at this time he felt himself already an artist, and at the hour of rest would walk forth into the middle ring all alone and with greatest dignity go through his practice. He would not be treated as a child, and scorned any suggestion that he go out and play. Play? He had work to do. Look here! Do you know any *man* who can throw a prettier row of flip-flaps than this? And wait! Here's a forward

somersault! Is it well done or not? Did he come over with a good lift? Like his father, you think? Ah! I can still see his chest swell with pride.

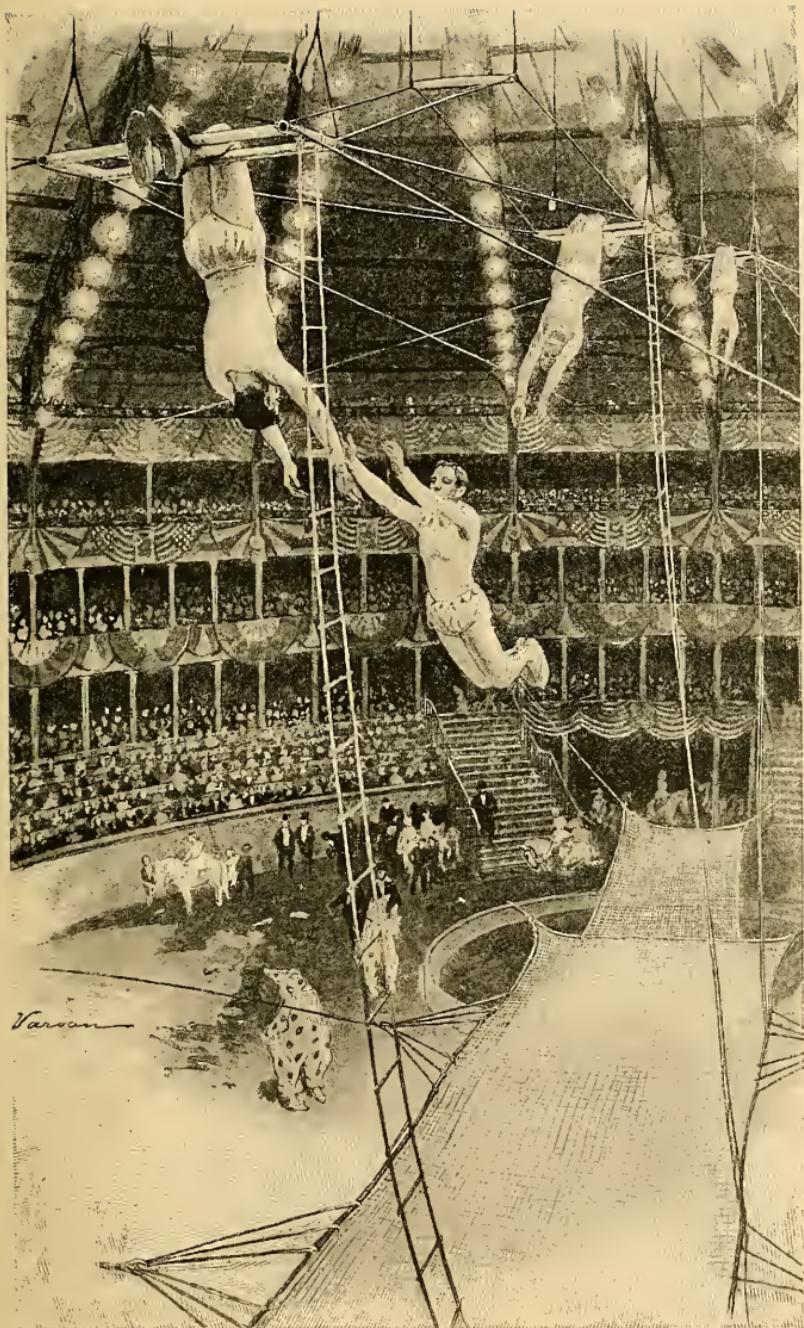
Nelson was not a regular member of the show; he was a child, and merely came along with his parents, the circus being his only home; but occasionally, after much teasing or as a reward for good behavior, his father would lead the boy forth before a real audience. And how they would applaud as the trim little figure in black-and-yellow tights rose slowly to the tent-top, feet together, body arched back, teeth set on the thong of the pulley-line that his father held anxiously!

And how the women would catch their breath when Nelson, hanging by his knees in the long swing, would suddenly pretend to slip, seem to fall, then catch the bar cleverly by his heels and sweep far out over the spread of faces, arms folded, head back, and a look that said plainly: "Don't you people *see* what an artist I am?"

This boy possessed the two great requisites in a trapeze performer, absolute fearlessness and a longing to perform in the air—which longing made him willing to take endless pains in learning. It would seem that acrobats differ from divers, steeple-climbers, lion-tamers, and the rest in this, that from their early years they have been strongly drawn to the career before them, to leaping, turning in the air, and difficult tricks on the trapeze and horizontal bars. The acrobat must be born an acrobat, not so much because his feats might not be learned by an ordinary man, but because the particular kind of courage needed to make an acrobat is not found in the ordinary man. In other words, to be an aérial leaper or an artist on the flying bars is quite as much a matter of heart as of agility and muscle. There are men who know how to do these things, but *can't*.

In illustration of this let me present three of my circus friends, Weitzel and Zorella and Danny Ryan, trapeze professionals whose daring and skill are justly celebrated. Zorella's real name, I may say, is Nagel, and so far from being a dashing foreigner, he is a quiet-spoken young man from Grand Rapids, Michigan, where he learned his first somersaults tumbling about on sawdust piles. And at sixteen he was the only boy in the region who could do the giant swing. Whereupon along came a circus with an acrobat who needed a "brother," and Nagel got the job. Two days later he began performing in the ring, and since then—that was ten years ago—he has n't missed a circus day.

The act that has given these three their fame includes a swing, a leap, and a catch, which seems simple enough until one learns the length and drop of that swing, and how the leapers turn in the air, and what momentum their bodies have as they shoot toward the man hanging for the catch from the last bar. It is Weitzel who catches the other two. He was "understander" in a "brother" act before he learned the trapeze; and the man who earns his living by holding two or three men on his head and shoulders while they do tricks of balancing is pretty sure to build up a strong body. And Weitzel needs all his strength when Danny springs from the pedestal over there at the tent-top fifty-two feet away, and, swinging through a half-circle thirty-six feet across, comes the last sixteen feet flying free, and turning twice as he comes. For all his brawny arms, Weitzel would be torn away by the clutch of that hurling mass, were not the strain eased by the stretch of fourteen thongs of rubber, seven on a side, that support his bar cords. And sometimes, as the leapers catch, the bar sags full four feet, and



"AS THEY SHOOT TOWARD THE MAN HANGING FOR THE CATCH
FROM THE LAST BAR."

then, as they "snap off" down to the net, springs nine feet up, so that Weitzel's head has many a time bumped the top support.

The catcher-man must hold himself ready for a dozen different leaps, must watch for the safety clutch where the four hands grip first at the elbows, then slide down the forearms to the wrists and hold there where the tight-bound handkerchiefs jam; he must know how to seize Zorella by the ankles when he shoots at him feet up after a backward double; he must know how to land Danny when he comes turning swiftly with eyes blindfolded and body bound in a sack.

All these feats are hard enough to do, yet still harder, one might say, is the mere starting to do them. There are scores of acrobats, well skilled in doubles and shoots and twisters, who would not for their lives go up on the pedestal whence Ryan and Zorella make their spring, and simply take the first long swing hanging from the trapeze. Nothing else, simply take the swing!

The fact is, there is an enormous difference between working on horizontal bars say ten feet above ground, and on the same bars thirty feet above ground, or between a trapeze act with leaps after a moderate swing, and the same act with leaps after a long swing. Often I have watched Ryan and Zorella poised on the pedestal just before the swing and holding the trapeze bar drawn so far over to one side that its supporting wires come up almost horizontal; and even on the ground it has made me dizzy to see them lean forward for the bar which falls short of the pedestal, so that they can barely catch it with the left-hand fingers, while the right hand clings to the pedestal brace. They need the send of that initial spring to give them speed, but—

Well, there was a very powerful and active man in Columbus, Ohio, a kind of local athlete, who agreed, on a wager, to swing off from the pedestal as Danny and Zorella did. And one day a small company gathered at the practice hour to see him do it. He said it was easy enough. His friends chaffed him and vowed he "could n't do it in a hundred years." The big man climbed up the swinging ladder to the starting-place, and stood there looking down. When you stand on the pedestal the ground seems a long way below you, and there is little comfort in the net. The big man said nothing, but began to get pale. He had the trapeze-bar all right with one hand; the thing was to let go with the other.

For ten minutes the big man stood there. He said he was n't in a hurry. His friends continued to joke him. One man urged him to come down. The professionals told him he 'd better not try it if he was afraid—at which the others laughed, and that settled it, for the big man *was* afraid; but he was stubborn, too, and, rising on his toes, he threw his right arm forward and started. He caught the bar safely with his right hand, swept down like a great pendulum, and at the lowest point of the swing was ripped away from the bar with the jerk of his two hundred pounds, and went skating along the length of the net on his face until he was a sorry-looking big man with the scratch of the meshes. Not one athlete in twenty, they say, without special training, could hold that bar after such a drop.

Zorella cited a case in point where a first-class acrobat was offered a much larger salary by a rival circus to become the partner of an expert on the high bars. "This man was crazy to accept," said Zorella, "and everything was practically settled. The two did their

act together on the low bars in great shape. Then they tried it on the high bars, and the new man stuck right at the go-off. Queerest thing you ever saw. He had to start on the end bar with a giant swing,—that gives 'em their send, you know,—then do a backward single to the middle bar, then a shoot on to the last bar, and from there drop with somersaults down to the net. All this was easy for him on the low bars, but when he got up high—well, he had n't the nerve to let go of the first bar after the giant swing. He kept going round and round, and just stuck there. Seemed as if his hands were nailed fast to that bar. We talked to him, and reasoned with him, and he tried over and over again, but it was no use. He could drop from the last bar, he could shoot from the middle bar, but to save his life he could n't let go of the first bar. I don't know whether he was afraid, or what; but he could n't do it, and the end of it was, he had to give up the offer, although it nearly broke his heart."

And even acrobats accustomed to working at heights feel uneasy in the early spring when they begin practising for a new season. The old tricks have always in a measure to be learned over again, and they work gradually from simple things to harder ones—a straight leap, then one somersault, then two. And foot by foot the pedestal is lifted until the body overcomes its shrinking. Even so I saw Zorella one day scratched and bruised from many failures in the trick where Weitzel catches him by the ankles. Here, after the long swing, he must shoot ahead feet first as if for a backward somersault, and then, changing suddenly, do a turn and a half forward, and dive past Weitzel with body whirling so as to bring his legs over just right for the catch. And every time they missed of

course he fell, and risked striking the net on his forehead, which is the most dangerous thing an acrobat can do. To save his neck he must squirm around, as a cat turns, and land on his back; which is not so easy in the fraction of a second, especially if you happen to be dazed by a glancing blow of the catcher-man's arm.

II

ABOUT DOUBLE AND TRIPLE SOMERSAULTS AND THE DANGER OF LOSING HEART

IN talking with my circus friends I was surprised to learn that a trapeze performer in perfect practice, say in mid-season, may suddenly, without knowing why, begin to hesitate or blunder in a certain trick that he has done without a slip for years. This happened to Danny Ryan in the fall of 1900, when he found himself growing more and more uncertain of his difficult piroquette leap, a feat invented by himself in 1896, and never done by another performer. Danny did it first when he used to play the clown with the spring-board leapers who do graceful somersaults over elephants and horses. With them would come Danny, made up as a fat man, and do a backward somersault and a full twister at the same time, the effect being a queer corkscrew turn that made the people laugh. They little suspected that this awkward-looking leap was one of the most difficult feats in the air ever attempted, or that it had cost Ryan weeks of patient practice and many a hard knock before he mastered it.

And then one day, after doing it hundreds of times with absolute ease, he did it badly, then he did it worse, then he fell, and finally began to be afraid of it and left it out of the act. Acrobats shake their heads when you ask for an explanation of a thing like that. They don't know the explanation, but they dread the thing.

"When a man feels that way about a trick, he 's got to quit it for a while," said Ryan, "or he 'll get hurt. 'Most all the accidents happen where a performer forces himself against something inside him that says stop. Sometimes an acrobat has to give up his work entirely. Now, there 's Dunham,—you 've heard of him,—the greatest performer in the world on high bars. They 'll give him any salary he wants to ask. Graceful? Well, you ought to see him let go from his giant swing and do a back somersault clean over the middle bar and catch the third! And now they say he 's gone out of the business. Somebody told me it was religion. Don't you believe it. He 's had a feeling—it 's something like fear, but it *is n't* fear—that he 's worked on high bars long enough."

"He 's had bad luck with his partners, too," remarked Weitzel. "Couple of 'em missed the turn somehow and got killed. Say, that takes a man's nerve as much as anything, to have his partner hurt. I don't wonder Dunham wants to quit."

"Tell you where it 's hard on an acrobat," put in Zorella—"that 's where he *can't* quit on account of his family—where he needs the money. I remember a young fellow joined the show out west to leap over elephants. He got along well enough over two elephants, but when it came to three, why, we could all see he was shaky. Some of the boys told him he 'd better stop, but he said he 'd try to learn, and he was such a nice, modest fellow and worked so hard that everybody wished him luck. But it was *n't* any use. One day he tackled a double over three elephants, and came down all in sections, with his right foot on the mattress and his left foot on the ground. That was his last leap, poor fellow, for the ankle bones snapped as his left foot struck, and a few hours later

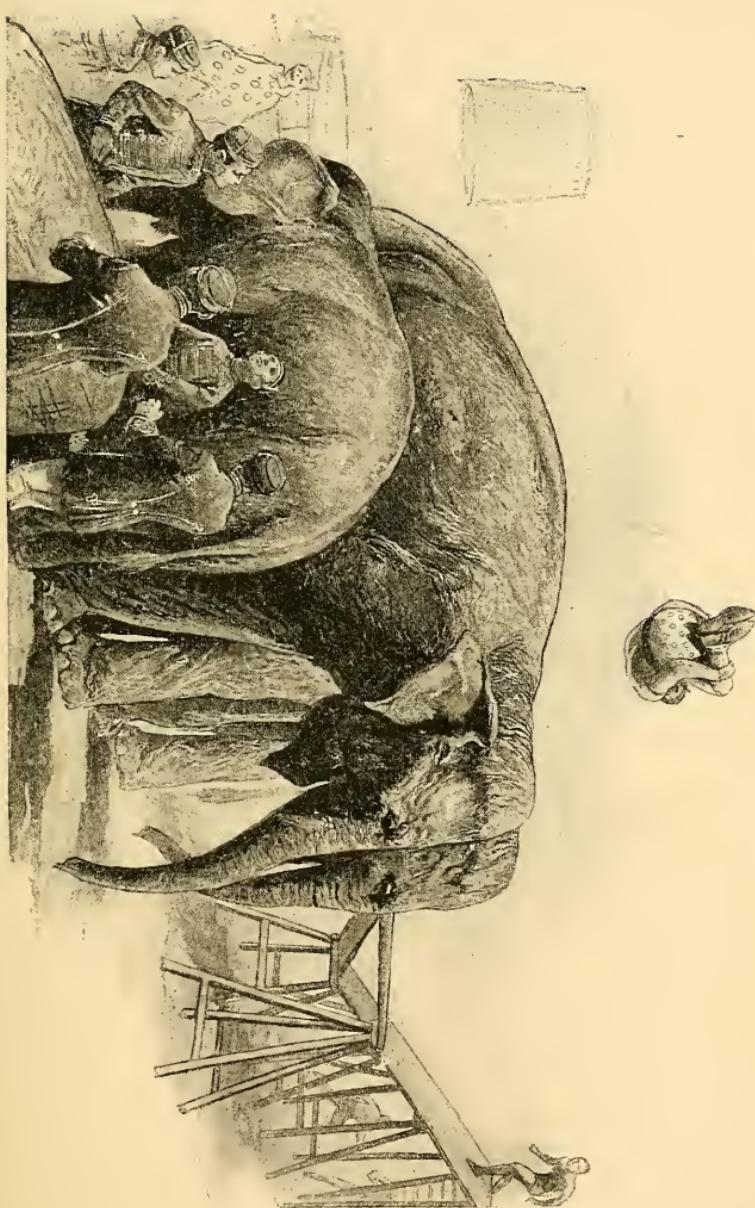
he lay in the dressing-room tent, pretty white, with the doctors over him. I 'll never forget the way he looked up at us when we came in. He was game all right, but his eyes were awful pathetic. 'Well, boys,' said he, 'here I am. I did the best I could.' Turned out he 'd done it for a sick wife and a little baby. Pretty tough, was n't it?"

Speaking of leaps over elephants brings to my mind an afternoon when I watched a circus rehearsal in the open air. That is a thing better worth seeing, to my mind, than the regular performance; the acrobats and riders in their every-day clothes are more like ordinary men and women, and their feats seem the more difficult for occasional slips and failures.

Here, for instance, are a mother and daughter, in shirt-waists, watching the trick monkey ride a pony, when suddenly a whistle sounds, and off goes the mother to drive three plunging horses in a chariot-race, while the daughter hurries to her part in an equestrian quadrille. And now these children playing near the drilling elephants trot into the ring and do wonderful things on bicycles. And yonder sleepy-looking man is a lion-tamer; and those three are the famous Potters, aerial leapers; and this thick-set fellow in his shirt-sleeves is Artressi, the best jumper in the circus. He 's going to practise now; see, they are putting up the spring-board and the long downward run that leads to it. These other men are jumpers, too, but Artressi is the star; he draws the big salary.

Now they start and spring off rather clumsily, one after another, in straight leaps to the mattress. They won't work into good form for some days yet. Here they come again, a little faster, and two of them try singles. Here comes Artressi. Ah! a double forward, and prettily taken. The crowd applauds. Now

"FOUR ELEPHANTS WAS ENOUGH FOR ANY MAN TO LEAP OVER."



a tall man tries a double. Gradually the practice gets hotter until every man is doing his best. There will be stiff joints here in the morning, but never mind!

In a resting-spell I sat down by Artressi and talked with him about leaping. It was hard, he said, going off a spring-board into empty air. Did n't know how it was, but he could always do better with something to leap over, say elephants or horses. He could judge the matress easier; was n't so apt to miss it. What was his biggest leap? Well, four elephants and three camels was about his best, with a pyramid of men on top. He'd cleared that twice a day for weeks some years ago, but he would n't do it now. No, sir; four elephants was enough for any man to leap over if he had a wife and child. That made a flight of thirty feet, anyhow, from the spring-board to the ground. Oh, yes, he turned two somersaults on the way—forward somersaults. It was n't possible for anybody to clear four elephants and turn backward somersaults.

I asked Artressi (his real name is Artress) about a leap with three somersaults, and found him positive that such a feat will never become part of a regular circus program. A man can turn the three somersaults all right, but he loses control of himself, and does n't know whether he is coming down right or wrong. In fact, he is sure to come down wrong if he does it often. Then he mentioned the one case where he himself had made a leap with three somersaults. It was down in Kentucky, at the home of his boyhood. Years had passed since he had seen the town, and in that time he had risen from nothing to a blaze of circus glory. He had become the "Great Artressi" instead of little Joe Artress, and now he was to appear before the people who knew him.

It was perhaps the most exciting moment of his life,

and as he came down the run toward the spring-board he nerved himself to so fine an effort that instead of doing two somersaults over the horses and elephants, as he intended, he did three, and, by a miracle of fortune, landed safely. That was his first and last triple; he was n't taking chances of a broken neck or a twisted spine, which had been the end of more than one ambitious leaper. No, sir; he would stick to doubles, where a man knows exactly what he 's doing.

In talking with acrobats, I came upon an interesting phenomenon that seems almost like a violation of the laws of gravitation. It appears that the movements of a performer on the bars or trapeze are affected in a marked degree by the slope of the ground underneath. In other words, although bars and trapeze may rest on supports that are perfectly level, yet the swing of an acrobat's body will be accelerated over a downward slope or retarded over an upward slope. So true is this that the trapeze performer swinging over an upward slope will often require all his strength to reach a given point, while over a downward slope he must hold back, lest he reach it too easily and suffer a collision. Nevertheless, the swing in both cases is precisely the same, with rigging and bars fixed to a true level.

On this point there have been endless arguments, and many persons have contended that acrobats must imagine all this, since the upward or downward slope of the ground under a trapeze can in no way affect the movement of that trapeze. I fancy the wisdom of such people is like that of the professors who proved some years ago that it is a physical impossibility for a ball-player to "pitch a curve." There is no doubt that trapeze performers are obliged to take serious account of the ground's slope in their daily work, to note care-

fully the amount of slope and the direction of slope, and to take their precautions accordingly. If they did not they would fail in their feats. Those are the facts to which all acrobats bear witness, let scientists explain them as they may.

"Suppose the ground slopes to one side or the other under your trapeze," I asked Ryan, one day. "How does that affect you?"

"It draws you down the slope, and makes your bar swing that way."

"What do you do about it?"

"Sometimes I pull the bar over a little in starting, so as to balance the pull of the hill; but that's uncertain. It's better to fix the rigging so that the bar is a little higher on the downhill side."

Ryan said that a straight-ahead downhill slope is the worst for a man, because he is apt to hold back too hard, being afraid of bumping into his partner, and so he does n't get send enough, and falls short of his mark.

"But all slopes are bad for us," he said, "and we try hard to get our things put up over level ground."

This is but one instance of the jealous care shown by acrobats for their bars and rigging. These things belong not to the circus, but to the individual performers, who put every brace and knot to the severest test. For the high bars a particular kind of hickory is used with a core of steel inside. Every mesh of the net must resist a certain strain. The bars themselves must be neither too dry nor too moist. The light must come in a certain way, and a dozen other things. Many an accident has come through the failure of some little thing.

This much is certain, that acrobats often suffer without serious injury falls that would put an end to ordi-

nary men. Like bareback riders, they *know how to fall*, this art consisting chiefly in "tucking up" into a ball and hardening the muscles so that the shock is eased. Also they have by practice acquired the power of deciding instantly how to make the body protect itself in an emergency.

"Now," said Ryan, "I'll give you a case where two of us did some quick thinking, and it helped a lot. We were with a circus in Australia, making a night run. It was somewhere in New South Wales, and every man was asleep in his bunk. First thing we knew, bang, rip, tear! a drowsy engineer had smashed into us and taken the rear truck of our sleeper clean off, and there were the floor timbers of our car bumping along over the ties. We had the last car.

"Our engineer never slowed up, and our floor was going into kindling-wood fast. It was as dark as pitch, and nobody said a word. Fred Reynolds and I—Reynolds was a clown acrobat—had lower berths right at the end, next to the negro porter, and I don't say we escaped because we were acrobats, but—well, this is what we did. Fred gave one mighty leap, just like going over elephants, and cleared the whole trail of wreckage that was pounding along behind the car and landed safe on the track. It was a crazy thing to do, in my opinion, but it worked. I made a spring for the chandelier, and hung there until the train stopped. And afterward I found my trousers back on the road-bed with the legs cut clean off, and I guess my own legs would have gone the same way if they'd been there. What did the porter do? Oh, he did nothing, and—and he was killed."

III

IN WHICH THE AUTHOR TRIES HIS HAND WITH PROFESSIONAL TRAPEZE PERFORMERS

ON this particular morning—it was a damp day in February—I had been watching the Potter family, familiar on circus posters in tights and spangles, at their practice of aerial leaps, when Henry Potter, who is husband, father, and brother of the others, and chief of the act, suggested that if I wanted a vivid idea of what it was to work on the flying trapeze I might come up and take his place on the cradle and let Tom chuck the “kid” across to me and see if I could catch him.

The “kid” was Roy Potter (sometimes Royetta, when presented in feminine trappings), a slender lad of seventeen, who had just been doing doubles and twisters and half turns, leaping with shoot and graceful curve from brother to brother up there in mid-air under the rafters of this moldering old skating-rink.

“Go ahead,” he urged; “it’s easy enough. All you’ve got to do is hang by your knees, and it can’t hurt the boy, for he’ll drop in the net if you miss him. Besides, we’ll put the ‘mechanic’ on him.”

The “mechanic” is an arrangement of waist straps and trailing pulley-ropes that guard a gymnast while he is learning some new feat.

Doubtless, I should have declined this amiable offer had I taken time to consider, for there was no particular appropriateness in a man who knew nothing

about the trapeze, except such rudiments as boys of twelve get in their own back yards, taking part off-hand in a leaping performance thirty feet above ground with "the phenomenal and fearless Potters"—I quote the circus signs—"greatest of all great acrobatic aérialists." Yet he put it so plausibly—I certainly *would* get a better idea of the thing—and he made it out so simple—anybody can hang by his knees—that I said all right; I would go up on the cradle and catch the "kid."

This cradle is composed of two steel bars, about a foot apart, that are held rigid by tackle and wire braces. You climb to it (after emptying your pockets) by a swinging ladder, none too secure, and, seated here, look down as from the dome of a circus tent. On a line with you are other cradles, where your partners are coolly preparing to do things. You glance across at them anxiously, then down at the net, which seems a long way beneath.

"Better put some rosin on your hands," sings out Potter from the ground, where he is arranging the "mechanic" lines.

"It 's in that little bag on the wire," calls the boy from his perch. "Rub it along your wrists, too; we 'll ketch better."

H'm! We will, eh? I do as I am told, and realize that even the trifling movement to get this rosin-bag involves a certain peril.

"Now lean back," comes the word; "catch one bar in the crotch of your knees and brace your feet under the other. That 's right. Hang 'way down. Stretch your arms out, and when I say, 'Now,' pull up and reach for the 'kid'—you 'll see him coming."

Sure enough, although the blood was in my head, I could see over there Tom Potter's red shirt and the

boy's blue one as they poised for the swing. Then Tom's body dropped back, and he swept the lad at full arm's length, through a half circle, and let him go head first, cutting the air, straight at me.

"Now," cried Harry, and I reached out as best I could, only to see the boy, a second later, floundering in the net below me. And they all were laughing. In trying to reach one way I had actually reached the other, and withdrawn my arms instead of extending them, which made me understand better than an hour of words that a man hanging head down at a height finds his muscles as hard to control as a penman writing with his left hand for the first time. He cannot even see straight until his eyes learn to gage distances and the relation of things presented upside down.

With some pains and an awkward clutching at the braces I got myself back into a sitting position, while Roy climbed again good-naturedly to his starting-cradle. A trapeze performer must have infinite patience.

Again we tried the trick, and this time, as I hung expectant, I felt my wrists clutched tight, and there was the agile leaper swinging back, pendulum fashion, from my arms, then forward, then back, while the bar strained under my knees.

"Now, throw him!" called Harry. "Stiffen out and chuck him back to Tom. Now!"

Alas! I made a bungle of it. I could not give him send enough, and the boy, falling short of Tom's arms, dangled from the "mechanic" lines half-way down to the net. It was quite plain that more than good intentions are needed to chuck young gentlemen through flights of eighteen feet. I was feeling decidedly queer by this time—a sort of half-way-over-the-Channel faintness, and could imagine what it must be to work

up here, right at the peak of a "big-top" tent, under the scorch of an August sun, with the stifle of a great audience coming up from below. I expressed a readiness to descend.

"Try a drop into the net," suggested Tom Potter. "See, hang by your hands, like this. Keep your legs together and lift 'em out stiff. Then—"

Down he went, and landed easily on his shoulders.

"Better put the 'mechanic' on him," said Harry, and presently young Roy was beside me on the cradle, securing me to the drop-lines with a double hitch.

"You want to be sure to lift yer legs," he remarked. "I knew a feller that struck the net straight on his feet and broke his knees."

"Don't you worry," said Harry; "if you don't fall right, I 'll hold you with the 'mechanic.' "

Of course, when a man has started at this sort of thing he must see it through, so I hung obediently by my hands, lifted my legs, and—

"Now," cried Harry, and instantly, before I had time to think or note sensations, I was on my back in the net. And I understood what a terrible problem it is for a gymnast, falling with such swiftness, to turn two or three somersaults in the air and land with the body at just the angle of safety, for a shade too much one way may mean a broken leg, and a shade too much the other way an injured spine.

For some time after my aérial experience I sat around rather limp and white, giving but indifferent attention to the breaking in of young Clarence Potter, baby of the family, now in his first fortnight's practising. He certainly showed a game spirit, this little fellow. When his father said, "Jump," he jumped, and when the call came for a forward somersault across and a half turn he went at it like a veteran, though his

wrists must have burned with red chafes where they caught him. Of course he had the 'mechanic' on all the time.

"We have to handle him very careful," said his father, "he 's so limber. It would n't take much to break his back. But he 'll harden up soon. People have an idea that gymnasts are supple-jointed. That 's all nonsense. A gymnast won't bend as much as an ordinary business man. There are too many bunches of muscles all over him that keep him stiff. See, feel along here." He prodded my hand into his back and sides. "Not big muscles, mind, but lots of small ones. Say, it 's a fine thing to have your body trained. I don't believe there 's a healthier— Hey, there! Keep those legs together. Easy now. Good boy!" The little fellow had made a pretty turn and drop to the net, and was striding along its meshes, beaming at the praise.

"He 'll make a gymnast," said Potter, "because he 's got a head on him, and can fix his mind on what he 's doing. Oh, it takes more than body to make a great acrobat. It takes brains, for one thing, and heart. I believe I 'll be able to train that boy so he can do a triple. I mean *do* it, not get through it in a Lord-help-me way. Most people say a triple can't be done for a regular act because it 's too uncertain and too dangerous. But they used to say that of a double. It 's all a matter of taking time enough in the practice. That 's the thing, practice. Why, look at us. We don't open for months yet, but we 're up here every morning all through the winter getting our act down so fine, and the time so perfect, that when summer comes we can't fail."

"How do you mean, getting the time perfect?"

"Why, in trapeze work everything depends on judg-

ing time. Just now when you were hanging from the cradle you could n't see much, could you? Well, we can't, either. We have to know when to do things by feeling the time they take. Say it 's a long double swing, where the men cross and change bars. Each man grabs or lets go at the second or part of a second when the watch inside him says it 's time to grab or let go. That 's the only watch he has, and it 's the only one he needs."

"And he dives by the sense of time?"

"That 's right."

"And does triple somersaults by the sense of time?"

"Certainly he does. He can't see. What could *you* see, falling and whirling? A gymnast has no different eyes from any other man. He 's got to *feel* how long he must keep on turning. And it 's good-by gymnast if his feeling is a quarter of a second out of the way."

"Do you mean that literally?"

Mr. Potter smiled. "I 'll give you a case, and you can judge for yourself. There was a fellow named Johnnie Howard in the Barnum show. He was doing trapeze work with the famous Dunham family, and was very ambitious to equal Dunham in all his feats, which was a large contract, for Dunham is about the finest gymnast in the world. What a pretty triple he can do, clean down from the top of the tent, and land right every time!"

"Well, Howard he kept trying triples, and sometimes he got 'em about right and sometimes he did n't. Dunham told him he 'd better stick to doubles until he 'd had more practice, but Howard would n't have it, and he kept right on. Prob'ly he thought Dunham was jealous of him. Anyhow, he tried a triple one night at Chicago, in the Coliseum, and that was

the last triple he ever did try. He misjudged his time by a quarter of a turn—that is, he turned three somersaults and a quarter instead of just three—and struck the net so that he twisted his spinal column, and he died a few weeks later. That last quarter of a turn killed him, and it probably did n't take over a tenth of a second."

Here was something to think about. Precision of movement to tenths of a second, with no guidance but a man's own intuition of time, and a life depending on it!

"Can a man regulate the speed of his turning while he is in the air?"

"Certainly he can. That 's the first thing you learn. If you want to turn faster you tuck up your knees and bend your head so the chin almost touches your breast. If you want to turn slower you stretch out your legs and straighten up your head. The main thing is your head. Whichever way you point that your body will follow. In our act we do a long drop from the top of the tent, where you shoot straight down, head first, for fifty or sixty feet and never move a muscle until you are two feet over the net. Then you duck your head everlasting quick and land on your shoulders."

I asked Mr. Potter how long a drop would be possible for a gymnast. He thought a hundred feet might be done by a man of unusual nerve, but he pointed out that the peril increases enormously with every twenty feet you add, say to a drop of forty feet. When you have dropped sixty feet you are falling thirty-five miles an hour; when you have dropped eighty feet you are falling nearly sixty miles an hour. And so on. It seemed incredible that a man shooting down, head first, at such velocity would wait before turning until only two feet separated him from the net.



CIRCUS PROFESSIONALS PRACTISING A FEAT OF BALANCING.

"It can't be," said I, "that in one of these straight drops a gymnast is guided only by his sense of time?"

Potter hesitated a moment. "You mean that he uses his eyes to know when to turn? I guess he does a little, although it is mostly sense of time."

"You would n't get a man to do it blindfolded?" I suggested.

"Not a straight drop, no; but a drop with somersaults, yes."

"What, two somersaults down to the net, blindfolded?"

"Yes, sir, that would be easy. I tell you a man's eyes don't help him when he 's turning in the air. Why, Tom and I would throw that boy of mine (Royetta) across from one to the other, he turning doubles, just the same whether he was blindfolded or not. It would n't make any difference."

"I 'll tell you another thing," he continued, "that may surprise you. It 's possible for a fine gymnast to swing from a bar, say sixty feet above the net, turn a back somersault—what we call a cast somersault—then shoot straight down head first for thirty feet and then tuck up and turn a forward somersault, landing on his shoulders. I could n't do it myself ever since I got hurt down in Mexico, but Tom Hanlon could. I mention this to show what control a man can get over his body in the air. He can make it turn one way, then go straight, and then turn the other way."

After proper expression of wonder at this statement, I asked Mr. Potter if something might not go wrong with this wonderful automatic time machine that a gymnast carries within himself. Of course there might, he said, and that is why there is such need of practice. Let a man neglect his trapeze for a couple of months, and he would be almost like a beginner. And even

the best gymnasts, he admitted, men in the pink of training, are liable to sudden and unaccountable disturbances of mind or heart that make them for the moment unequal to their most familiar feats.

"I 'll tell you what accounts for the death of most gymnasts," he went on. "It 's changing their minds while they 're in the air. That 's what we call it, but it 's only a name. Nobody knows just what happens when a gymnast changes his mind—I mean what happens inside him. What happens outside is that he 's usually killed.

"Now there was Billy Batcheller. He was a fine leaper, and could do his two somersaults over four elephants or eight horses with the prettiest lift you ever saw. He could do it easy. But one day—we were showing out west with the Reynolds circus—as he came down the leaping-run he struck the board wrong, somehow, and in the turn he changed his mind; instead of doing a double he did one and a half and shot over the last horse straight for the ground, head first. One second more and he was a dead man; he would have broken his neck sure, but I saw him coming and caught him *so* with my right arm, took all the skin off under his chin, and left the print of my hand on his breast for weeks. But it saved him. And the queer thing was he never could explain it—none of them ever can; he just changed his mind. So did Ladell, who used to do doubles from high bars down to a pedestal. He made his leap one night, just as usual—it was at Toronto, in 1896, I think—and as he turned he changed his mind, and I forgot how he landed, but it killed him all right."

"Did you ever have an experience of this kind yourself?" I asked.

"Not exactly," he answered, "and I 'm thankful I have n't, but I came near it once in Chicago. It was the night after Howard got hurt, and I guess fear—just plain, every-day fear—was at the bottom of my feeling. My wife and I were doing an act sixty feet above the ground, and without a net. I would hang by my hands from a couple of loops at the top of the Coliseum, and she would hang, head down, from my feet, her ankles locked across mine, just a natural locking of the feet, with no fastenings and only ordinary performing shoes.

"When I had her that way, a man below would pull a drag-rope and get us swinging higher and higher, until finally we would come right up to a horizontal. I tell you it was a hair-raising thing to see, but until this night I had never thought much about the danger. I thought of it now, though, as I remembered Howard's fall, and I got so nervous for my wife that I felt sure something terrible was going to happen. I was just about in the state where a man starts his act and can't go through with it, where he changes his mind. And you 'll be surprised to hear what gave me heart to go on."

"What was it?"

"It was the music, sir ; and ever since that night I 've understood why some generals send their soldiers into battle with bands playing. As we stood by the dressing-room entrance waiting to go on, it seemed as if I could n't do it, but when I heard the crash of that circus band calling us, and came out into the glare of light and heard the applause, just roars of it, why, I forgot everything except the pride of my business, and up we went, net or no net, and we never did our toe swing better than that night. Just the same, I 'd

had my warning, and I soon got another act instead of that one; and—" He hesitated. "Well, sir, to-day I would n't take my wife up and do that toe swing the way we used to, not for a million dollars. And yet she 's crazy to do it."

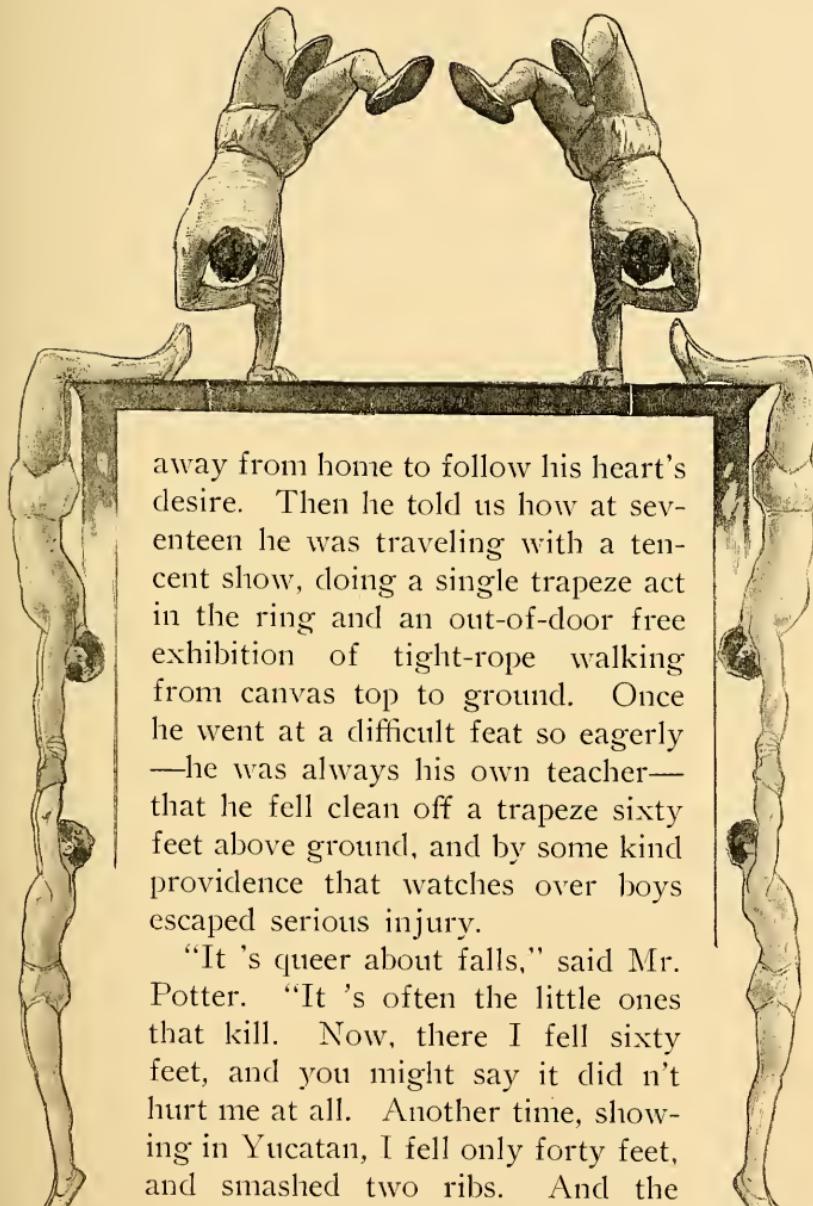
IV

SOME REMARKABLE FALLS AND NARROW ESCAPES OF FAMOUS ATHLETES

AS we finished our talk, Mr. Potter asked me to call some evening at their rooms, on Tenth Street, and see a family of trapeze performers in private life. I was glad to accept this invitation, and looked in upon them a day or two later. Like the other figures in these studies of thrilling lives, they presented a modest, simple picture in their home circle. There is nothing in the externals of lion-tamers, steeple-climbers, divers, balloonists, or gymnasts to betray their unusual calling. Nor is there any heroic sign in eye or voice or bearing. They are plain, unpretentious folk, for the most part, who do these things and say little about them.

In one room were Tom and Royetta playing checkers, while Clarence, the "kid," weary, no doubt, from the morning's practice, lay on a bed storing up resistance against the next day's shoots and twisters. In a room adjoining were Mr. Potter himself and Mrs. Potter enjoying the call of a lady acrobat, one of the famed Livingstons, trick bicyclists.

As soon as was fitting, I put the old question to Mr. Potter, the question that always interests me, how it happened that he became a gymnast, and he went back to his Western boyhood and the early longings that possessed him to be a performer in the air. Plainly he was born with the gymnast instinct, and he ran



away from home to follow his heart's desire. Then he told us how at seventeen he was traveling with a ten-cent show, doing a single trapeze act in the ring and an out-of-door free exhibition of tight-rope walking from canvas top to ground. Once he went at a difficult feat so eagerly—he was always his own teacher—that he fell clean off a trapeze sixty feet above ground, and by some kind providence that watches over boys escaped serious injury.

"It 's queer about falls," said Mr. Potter. "It 's often the little ones that kill. Now, there I fell sixty feet, and you might say it did n't hurt me at all. Another time, showing in Yucatan, I fell only forty feet, and smashed two ribs. And the worst fall I ever had was fifteen feet

at the Olympia, in London. I was driving four horses in a tandem race, and was thrown straight on my head. That time I nearly broke my neck."

"Twenty-five feet is my best fall," put in Mrs. Potter, smiling. "I was doing an act on the flying rings, and one of 'em broke. Remember that, Harry?"

His face showed how well he remembered it. "Perhaps you won't believe this," he said, "but when I saw her falling I could n't move. I was 'tending her in the ring, and was n't ten feet from where she struck. I could have caught her and saved her if my legs would only have moved. But there they were frozen, sir, and I just had to stand still and see my wife come down smash on her head. Pretty tough, was n't it? She lay unconscious for two days—that was at Monette, Missouri. Oh, yes, I remember it!"

I asked Mrs. Potter if she had ever been afraid, and she shook her head. Never once, not even at Chicago, in the perilous toe swing, when even the other gymnasts told her she would certainly be killed. She knew her husband would hold her safe, and she really enjoyed that toe swing more than any act they ever did.

"I 'll tell you this, though," she admitted, "I would be afraid to do these things with any one except my husband."

"Yes, and I 'd be afraid to have her," added Potter. "Why, down in Mexico, when I broke my ribs, there was a man—a fine gymnast, too—who offered to take my place so we would n't lose our salary, but every time I saw him practice with my wife it made me so nervous I called it off and let the salary go."

In spite of these manifest hazards, Potter insists that there is no healthier life than a gymnast leads. "We never are ill," he said, "we never take cold, we travel through all sorts of fever-stricken countries and never catch anything, and we always feel good. Look at that boy of mine! He 's seventeen years old, and

he 's got a chest on him like a man. Thirty-eight inches is what it measures. Why, I can't find a coat that 'll fit him."

He went on to point out some plain advantages, in addition to health, that ordinary citizens might derive from a moderate knowledge of trapeze work. In a fire, for instance, a man so trained would have little difficulty in saving himself and others by climbing and swinging. And firemen themselves would double their efficiency by regular practice on high bars.

Again, in case of a runaway, a man familiar with the trapeze knows how and when to spring for the bridle of a plunging horse. Or should he find himself almost under the wheels of a trolley-car, he could leap for the platform rail and swing up to safety.

"I 'll give you a case," said Potter, "where the training we get helped a good deal. It was a season when I was working with the Barnum outfit; we were showing in the East, and during the hippodrome races a little girl got away from her people somehow, and the first thing anybody knew, there she was out on the track, with three four-horse chariots not a hundred feet off, and coming on a dead run. As the crowd saw the child they gave a great 'Uff' in fear, and lots of women screamed. It was n't in human power to stop those horses, and it seemed as if the little tot must be killed.

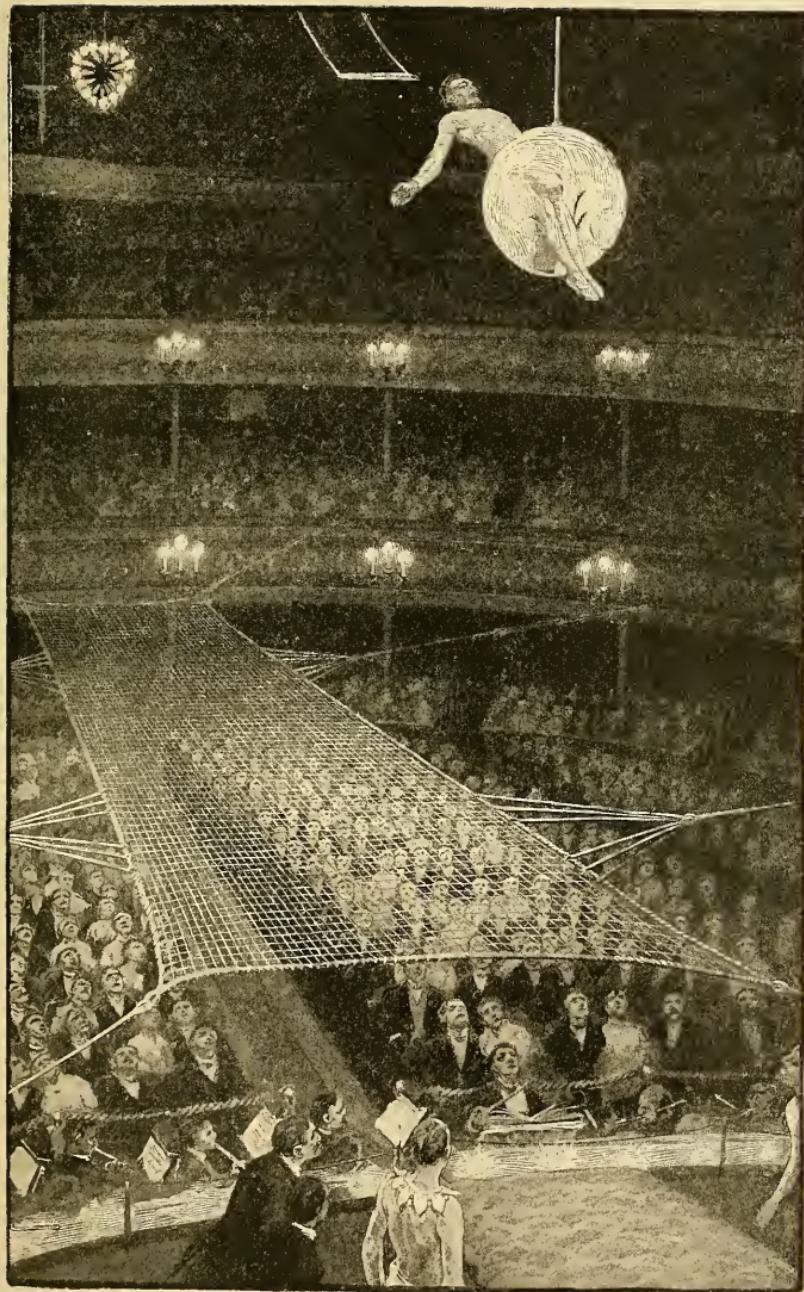
"She was about half-way across the track when I started for her. Lots of men would have started just as I did, but very few would have gone at just the right angle to save her. Most men would have tried to run straight across, but I was sure the horses would trample me and the child, too, if I tried that. So I took her on a slant, running across and away from the horses, and I caught her little body as a gym-

nast knows how, did n't waste any time at it, and then —hoo!—we were over, with the breath of those horses on our necks. If it had n't been for the practice I 've had judging time and distance, we 'd both have been killed that trip."

I come now to another occasion when I spent two profitable hours with the St. Belmos, husband and wife, who for years past and in many parts of the world have appeared in a trapeze act that calls for the greatest nerve and precision of movement. As a climax to this act, St. Belmo makes a leap and swing of forty feet over his audience, springing head first through a circle of knives and fire that barely lets his body pass, then catching a suspended trapeze that breaks away at his touch and carries him on in a long sweep, then leaping again, feet first, from this flying bar through a paper balloon, where he holds by his arms and drops swiftly thirty-five feet to the ground.

I was surprised to find the hero of this perilous feat rather the reverse of athletic in appearance. St. Belmo struck me as a pale, thin, almost sickly man. Yet I judge it would fare ill with any one who tried to impose upon him as an invalid. Over that spare form are hard, tireless muscles, and for years to come St. Belmo feels equal to leaping this obstacle of blades and flame.

Most people, I suppose, in watching this act would imagine the knives to be of wood and tinsel, but I saw that they were of steel, and sharp, heavy double-edged knives a foot long, murderous weapons made by St. Belmo himself out of old saws. And fifteen of these, with points turned inward, form the heart through which this gaunt yet rather genial gymnast shoots his way.



THROUGH A PAPER BALLOON AT THE END OF A GREAT FEAT.

these careers take on more poignant interest when things go wrong. Had he ever struck the knives when leaping through? Yes, again and again. He had torn his clothes to tatters on them, and lined his body with scars. But that was years ago, when he was learning. Now he never touched the knives. He could leap through them, eyes shut, as surely as a man puts a spoon in his mouth without striking his teeth.

How about falls in the air? Well, he remembered two in particular, one at Syracuse, where he missed the trapeze because some one was careless in fastening a snap-hook that held it, and when he came through the blades and flames head first, and reached for the bar, the bar had swung away, and he plunged on smash down to the ground, and broke both legs.

"Did n't you look for the bar before you made the leap?" I questioned.

He shook his head. "I never see the bar for the dazzle of fire. I know where it must be, and leap for that place. If it is n't there, why—" He pointed down to his legs, and smiled ruefully.

He had another fall at Seattle, where he came down thirty-five feet and put both his knees out of joint, all because he was thinking of something else as he shot toward the balloon, and forgot to throw out his arms and catch in the hoop. It was exactly the case of a man who might walk over the edge of a house-top through absent-mindedness.

"Eyer have a feeling of fear?" I asked.

"I don't know as you 'd call it fear exactly," he began.

"Yes, it was fear, too," put in his wife, teasing. "I 've seen your knees shake so up on the pedestal that you almost tumbled off."

"No wonder my knees shook," protested St. Belmo;

"they 've been out of joint times enough. Naturally, after an accident you feel a little queer for a while; but I 'll own up there was once I felt afraid, and it was n't long ago, either."

"I know," said his wife: "up at the Twenty-second Regiment Armory."

"That 's right; it was in December. Remember when that bicycle-diver was killed? His name was Stark? Poor chap! He was a friend of ours, and we were there when it happened. You know, he got too much speed on the incline, and struck the far edge of the tank instead of the water. That was in the afternoon, and the same night we had to go on and do our act. I looked at that tank, and then I said, 'Boys, I 'm leary about this, but I 'm going to do my act. I 'll come down somehow, boys; you watch me.' Honest, I thought I was going to be killed, but I got through all right."

Then he explained that the greatest danger in his act is neither at the knives nor at the balloon, but in the swift drop after the balloon with the hoop under his arms. This hoop, as it goes down, winds up a spring overhead that acts as a break on the fall, though a very slight one. Just before St. Belmo reaches the floor he lifts his arms above the hoop and drops through it to the ground, but he must do that at precisely the right moment, or he will suffer accident. If he drops through too soon he will strike too hard, and may break his legs. If he does not drop through soon enough, the hoop may jerk his arms out of the sockets. And in spite of this formidable alternative St. Belmo assured me that for more than a dozen years now he has made this drop continually, and never failed once.

Think of a calling that requires a man to steer per-

petually, by the closest fraction of a shave, between a pair of broken legs and a pair of dislocated arms! Fancy such an alternative as part of the regular after-dinner routine! And then consider what marvelous precision must be in these bodies and minds of ours when a man can face such a hazard for years and never come to grief.

THE WILD-BEAST TAMER

I

WE VISIT A QUEER RESORT FOR CIRCUS PEOPLE
AND TALK WITH A TRAINER OF ELEPHANTS

WELL down on Fourth Avenue, below the bird-fanciers, the rat-catchers, the antique-shops, and the dingy hotels where lion-tamers put up, is "Billy's" place, the great rendezvous of the country for circus folk, and here any afternoon or evening, especially in the dull winter-time, you may find heroes of the flying trapeze, bereft of show-ring trappings, playing monotonous euchre with keepers of the cages, or sitting in convivial and reminiscent groups that include everything from the high-salaried star down to some humble tooter in the band at present looking for a job. All kinds of acrobats come to "Billy's," all kinds of animal men, everybody who has to do with a show, barring the owners. If a Norwegian wrestler wants to get track of an Egyptian giant he goes to "Billy's." If an elephant-trainer needs a new helper he goes to "Billy's." It is at once a club, a haven, a post-office, and a general intelligence bureau for members of this wandering and fascinating profession.

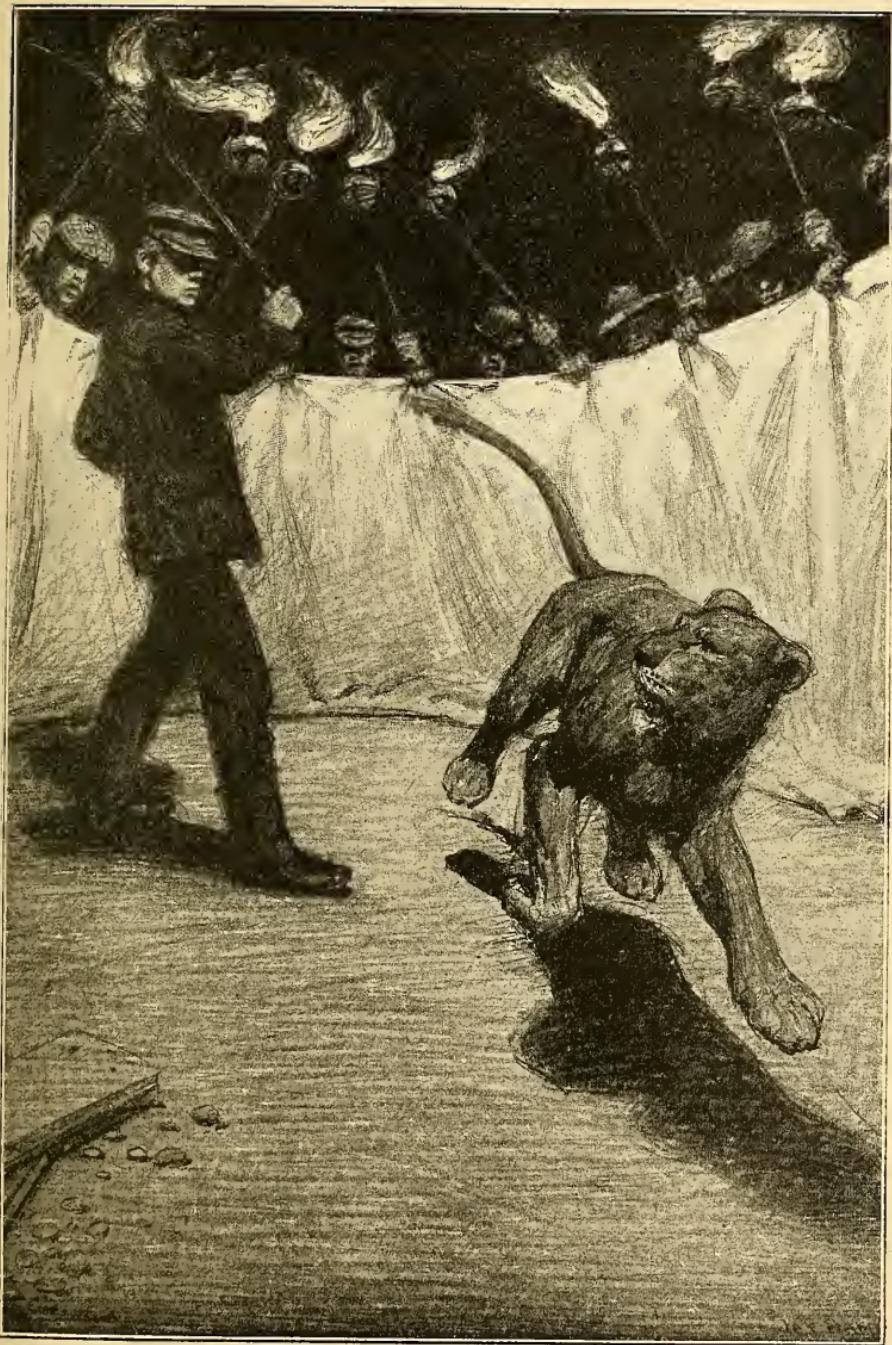
It was my fortune recently to spend an evening at "Billy's," and I had as companion a veteran circus man, able to explain things. After taking in the externals, which were commonplace enough save for "big-top" celebrities ranged along the walls in tiers of photo-

graphs, we sat us down where a man in a blue shirt was telling how a lioness and three cubs got out of a cage somewhere one afternoon just after the performance. It seems one of the cubs had been playing with a loose bolt, and the first thing anybody knew, there they were, all four of them, skipping about free in the menagerie tent. The story detailed various efforts to get the lioness back into her cage—prodding, lassoing, shouting—and the total failure of these because she would neither leave her cubs nor let them be taken from her.

Finally, the situation grew serious, for the evening performance was coming on, and it was quite sure there would be no audience with an uncaged lioness on the premises. So it became a matter of business in this wise—a lioness worth a few hundred dollars against an audience worth a couple of thousand. Word was sent to the head of the show, and back came the order, "Kill her." In vain the keeper pleaded for one more trial; he would risk a hand-to-hand struggle with hot irons. The head of the show said, "No"; the lioness was desperate, and he would n't have his men expose their lives. It was a case of "Shoot her, and do it quick."

Of course, that settled it; they did shoot her, and as the blue-shirted man described the execution I was impressed by his tenderness in speaking of that poor, defiant mother, and then of the three little cubs that "howled for her a whole month, sir, and looked so sad it made us boys feel like murderers, blamed if it did n't!"

Another man, with steely gray eyes and a stubble of beard, ventured the opinion that they must have had a pretty poor quality of gumption in that outfit, or somebody would have got the lioness into her cage. He was mighty sure George Conklin would have done



HOW THE LIONESS WAS CAPTURED ON THE OPEN PRAIRIE.

it. George was over in Europe now handling big cats for the Barnum show. There was n't anything George did n't know about lions.

"Why, I 'll give you a case," said he. "We were showing out in Kansas, and one night a cage fell off the circus train, became unashed or something as she swung round a curve, and when we stuck our heads out of the sleeper there were a pair of greenish, burning eyes coming down the side of the track, and we could hear a ruh-ruh-r-r-r-ruh—something between a bark and a roar—that did n't cheer us up any, you 'd better believe. Then George Conklin yelled, 'By the Lord, it 's Mary! Come on, boys; we must get her!' and out we went. Mary was a full-grown lioness, and she was loose there in the darkness, out on a bare prairie, without a house or a fence anywhere for miles."

"Hold on," said I; "how did your circus train happen to stop when the cage fell off?"

With indulgent smile, he explained that a circus train running at night always has guards on the watch, who wave quick lanterns to the engineer in any emergency.

"Well," continued the man, "George Conklin had that cage fixed up and the lioness safe inside within forty minutes by the clock. Do? Why, it was easy enough. We unrolled about a hundred yards of sidewall tenting, and carried it toward the lioness. It was a line of men, holding up a length of canvas so that it formed a long, moving fence. And every man carried a flaming kerosene torch. There was a picture to remember, that line of heads over the canvas wall, and the flaring lights gradually circling around the lioness, who backed, growling and switching her tail—backed away from the fire, until presently, as we closed in, we had her in the mouth of a funnel of canvas, with

torches everywhere, except just at her back, where the open cage was. Then Conklin spoke sharp to her, just as if they were in the ring, and snapped his whip, and the next thing Miss Mary was safe behind the bars. It was a pretty neat job, I can tell you."

During this talk a broad-shouldered man had joined the group, and my companion whispered that he was "Bill" Newman, the famous elephant-trainer. Mr. Newman at once showed an interest in the discussion, and agreed that there are times when you can do nothing with an animal but kill it.

"Now, there was old Albert," said he, "a fine ten-foot tusker, that I 'd seen grow up from a baby, and I was fond of him, too, but I had to kill him. It was in '85, and we were showing in New Hampshire. Albert had been cranky for a long time—never with me, but with the other men—and in Nashua he slammed a keeper against the ground so hard that he died the next morning just as we were coming into Keene. That settled it, and at the afternoon performance Mr. Hutchinson announced in the ring that we had an elephant on our hands under sentence of death, and he was willing to turn this elephant over to the local rifle corps if they felt equal to the execution. You see, he had heard there was a company of sharpshooters in Keene, and it struck him this was a good way to be rid of a bad elephant, and get some advertising at the same time.

"Well, those Keene riflemen were n't going to be bluffed by a showman. They said to bring on the elephant, and they 'd take care of him. So, after the performance I led old Albert back to a piece of woods behind the tents, and we hitched tackle to his four legs and stretched him out between four trees so he could n't move, and then the rifle corps lined up about

twelve paces off, ready to shoot. That elephant knew he was going to die; yes, sir, he knew it perfectly well, but he was a lot cooler than some of those riflemen. Why, there was one fellow on the end of the line shaking so he could hardly aim. You see, they were afraid old Albert would break loose and come at 'em if they only wounded him.

“‘Do you men know where to shoot?’ I called out.

“‘We ’re going to shoot at his head,’ answered the captain.

“‘All right,’ said I; ‘you ’d better send for lanterns and more ammunition. You ’re liable to be shooting here all night.’

“‘Then, where shall we shoot?’ asked the captain.

“‘That depends,’ I answered. ‘If you can send your bullets straight into his eye at a forty-five degree up-slant, you ’ll fix him all right. But if you don’t hit his eye you can shoot the rest of his head full of holes, and he won’t care. You ’ve got to reach his brain, and that ’s a little thing in where I ’m telling you.’

“This made the captain do some thinking, for Albert looked awful big and his eye looked awful small, and they did n’t want to bungle the job. ‘Well,’ said he, ‘is there any other place we can aim at except his eye?’

“‘Aim here,’ I told him, and I drew a circle with a piece of chalk just back of his left foreleg, a circle about as big as your hand. When a man has cut up as many elephants as I have he knows where the heart is. But most men don’t.

“After this there was a hush, while the whole crowd held its breath, and old Albert looked at me out of his little eyes as much as to say, ‘So you ’re going to let ’em do me after all, are you?’ and then came the sharp command, ‘Ready, fire!’ and thirty-two rifle-balls

started for that chalk-mark. And how many do you think got there? Five out of thirty-two; I counted 'em, but five did the business. Poor old Albert dropped without a sound or a struggle." Newman sighed at the memory:

"Is n't there some exaggeration," I asked, "in what you said about shooting an elephant full of holes without killing him?"

"Exaggeration!" answered Newman. "Not a bit of it. Why, there was an elephant named Samson with the Cole show, and he got loose once in a town out in Idaho and ran through the streets crazy mad, killing horses, smashing into houses, ripping the whole place wide open. Well, sir, they shot at him with Winchesters, revolvers, shot-guns, every darned thing they had, until that elephant was full of lead, but he went off all right the next day, and never seemed any the worse for it up to the day when he was burned to death with the Barnum show at Bridgeport."

The mention of this catastrophe reminded me of reports that wild beasts in a burning menagerie are silent before the flames, and I asked Mr. Newman if he believed it.

"No, sir," said he; "it is n't true. I was in Bridgeport when the Barnum show burned up, and I never heard such roaring and screaming. It was awful. Even the rhinoceros, which can't make much noise, was running around the yard grunting and squealing, with flames four feet high shooting up from his back and sides. You see, a rhinoceros is almost solid fat, and as soon as he caught fire he burned like an oil-tank."

"Did n't you save any lions or tigers?"

He shook his head. "Was n't any use trying. They'd have been shot by policemen as fast as we could get 'em out. Besides, we could n't get 'em out. We

concentrated on elephants, and saved all the herd but five. There were free elephants all over Bridgeport that night, and a queer thing was we had to look sharp that some of the elephants we'd saved did n't run back into the fire. You know how horses will go back into a burning stable. Well, elephants are just the same. That's how we lost the white elephant. She walked straight into the blaze, when she might just as well have walked out through the open door."

By this time most of the company at "Billy's" had gathered about to listen, for Newman was a veteran among veterans, and was now in the full swing of reminiscence. He went back to his earliest days, back to Putnam County, New York, where young men might well be drawn to the circus life, so many famous showmen has this region produced—"Jim" Kelly and Seth B. Howes and Langway and the Baileys.

"I started with Langway, the old lion-tamer," said Newman, "and he was one of the best. I'll never forget what he told me once when he was breaking in a den of lions and tigers—there were three lions and two tigers, all full grown and fresh from the jungle.

"'Bill,' said he, 'I'm an old man, and this here is my last den. I won't break in no more big cats, but I'll break this den in so they'll never work for another man after I'm gone. It'll look easy what I do, and folks'll want you to tackle 'em, Bill, but don't you never do it, for if you do these cats'll chew ye up sure.'

"Well, he worked that den in great shape for a year or so, and then he died, and I minded his words. I let those lions and tigers alone. They hired a lion-tamer named Davis to work 'em, and sure enough he got chewed up bad, just as the old man said he would, and the end of it was that nobody ever *did* work that den again; it could n't be done, although they'd been



MAN IN CAGE WITH LIONS.

like kittens with Langway. What he did to 'em 's always been a mystery."

Newman paused, as impressive story-tellers do, and then, drawing once more upon his memories, he told how a terrible death came to poor "Patsy" Meagher as he was drilling a herd of elephants once in winter quarters at Columbus, Ohio.

"It was the day before Thanksgiving," he said. "I 'll never forget it, and a big bull elephant named Syd took the order wrong, went 'right face' instead of 'left face,' or something, and 'Patsy' got mad and hooked him pretty hard. Some think it was 'Patsy's' fault, because he gave the wrong order by mistake and Syd did what he said, while the other elephants did the thing he meant to say. Anyhow, Syd turned on 'Patsy' and let him have both tusks, brass balls and all, right through the body. Killed him in half a minute. Why, sir, they took 'Patsy's' watch out through his back. That 's the sort of thing you 're liable to run up against."

"Did they kill Syd?" I asked.

"No; they gave him the benefit of the doubt. You see, it ain't square to blame an elephant for obeying orders."

Then came the story of how they killed bad old Pilot at the Madison Square Garden back in 1883, fought his hard spirit all night long with clubs and pitchforks and prods and hot irons, one hundred men flaying and jabbing in relays against a poor, bound animal that died rather than yield—died without a sound as day was breaking. "Yes, sir," said Newman; "he never squealed, he would n't squeal, and three minutes before he died he nearly killed me with a swing of his trunk: Oh, he was game all right, Pilot was."

Newman came back to the difficulty of working

animals broken in by another tamer, but he declared that the thing can be done in some cases if the new tamer has in him that unknown something to which all wild beasts submit. His own wife, for example, after a dozen years of peaceful married life, determined one day that she would make a herd of eight big Asiatic elephants obey her, a thing no woman had ever attempted. And within three weeks she did it, and drilled the herd in public for years afterward—in fact, became a greater star than her husband. All of which was most unusual, and due entirely to her exceptional nerve and physical power. “Why, sir,” said Newman, proudly, “she was six feet tall and built like an athlete. She—she only died a few years ago, and—and—” That gulp and the catch in his voice told the whole story. This was no longer a dauntless elephant-trainer, but a stricken, heart-broken man. What now were glories of the ring to him—his wife was dead!

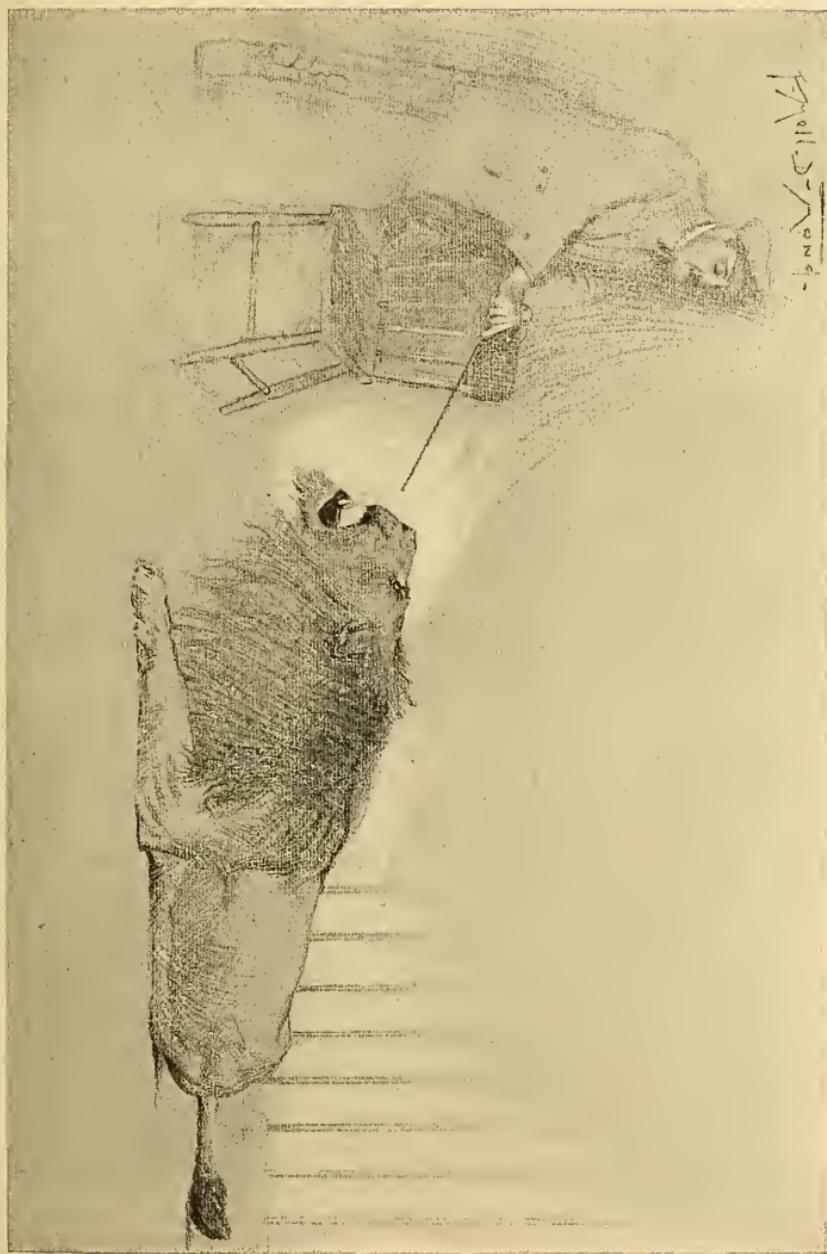
II

METHODS OF LION-TAMERS AND THE STORY OF BRUTUS'S ATTACK ON MR. BOSTOCK

THE wild-beast tamer as generally pictured is a mysterious person who stalks about sternly in high boots and possesses a remarkable power of the eye that makes lions and tigers quail at his look and shrink away. He rules by fear, and the crack of his whip is supposed to bring memories of torturing points and red-hot irons.

Such is the story-book lion-tamer, and I may as well say at once that outside of story-books he has small existence. There is scarcely any truth in this theory of hate for hate and conquest by fear. It is no more fear that makes a lion walk on a ball than it is fear that makes a horse pull a wagon. It is habit. The lion is perfectly *willing* to walk on the ball, and he has reached that mind, not by cruel treatment, but by force of his trainer's patience and kindness and superior intelligence.

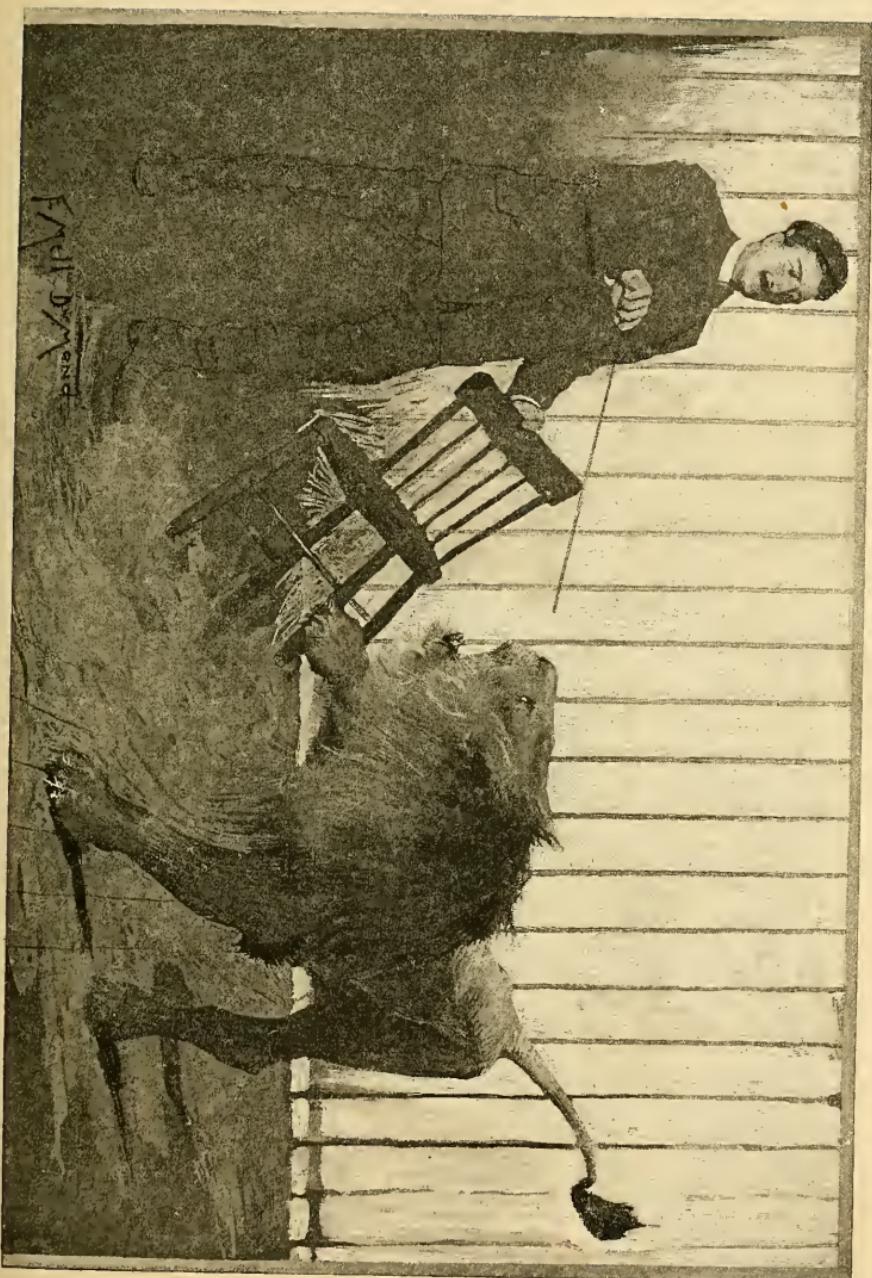
Of course a wild-beast tamer should have a quick eye and a delicate sense of hearing, so that he may be warned of a sudden spring at him or a rush from behind; and it is important that he be a sober man, for alcohol breaks the nerve or gives a false courage worse than folly: but the quality on which he must chiefly rely and which alone can make him a *great* tamer—not a second-rate bungler—is a genuine fondness for



his animals. This does not mean that the animals will necessarily be fond of the tamer; some will be fond of him, some will be indifferent to him, some will fear and hate him. Nor will the tamer's fondness protect him from fang and claw. We shall see that there is danger always, accident often, but without the fondness there would be greater danger and more frequent accident. A fondness for lions and tigers gives sympathy for them, sympathy gives understanding of them, and understanding gives mastery of them, or as much mastery as is possible. What but this fondness would keep a tamer constantly with his animals, not only in the public show (the easiest part), but in the dens and treacherous runway, in the strange night hours, in the early morning romp, when no one is looking, when there is no reason for being with them except the tamer's own joy in it?

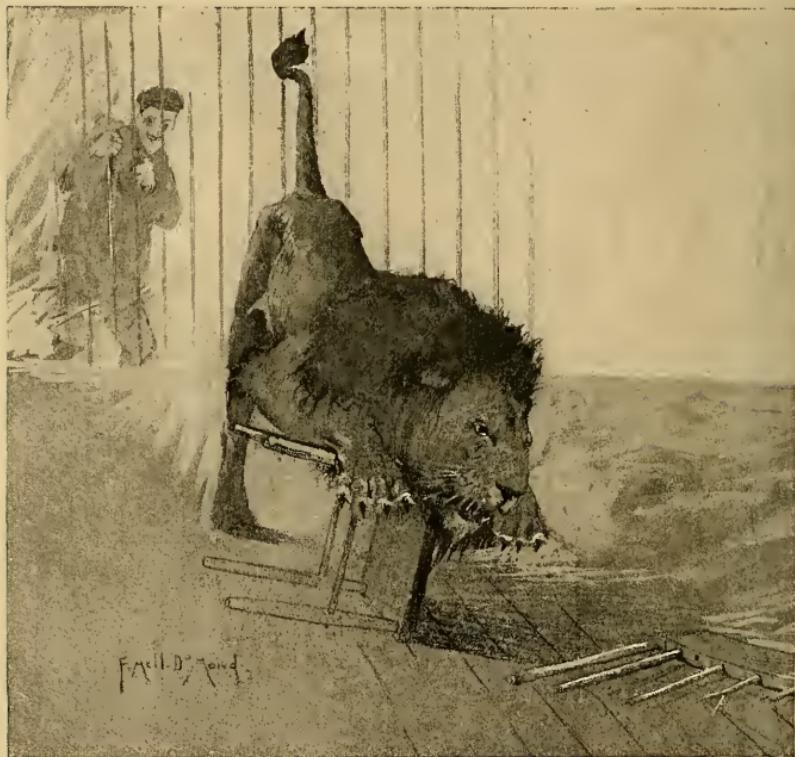
I do not purpose now to present in detail the methods of taming wild beasts; rather what happens after they are tamed: but I may say that a lion-tamer always begins by spending weeks or months in gaining a new animal's confidence. Day after day he will stand for a long time outside the cage, merely looking at the lion, talking to him, impressing upon the beast a general familiarity with his voice and person. And each time, as he goes away, he is careful to toss in a piece of meat as a pleasant memento of his visit.

Later he ventures inside the bars, carrying some simple weapon—a whip, a rod, perhaps a broom, which is more formidable than might be supposed, through the jab of its sharp bristles. One tamer used a common chair with much success against unbroken lions. If the creature came at him, there were the four legs in his face; and soon the chair came to represent boundless power to that ignorant lion. He feared it and



hated it, as was seen on one occasion when the tamer left it in the cage and the lion promptly tore it into splinters.

Days may pass before the lion will let his tamer do more than merely stay inside the cage at a distance.



THE LION DESTROYS THE CHAIR.

Very well ; the tamer stays there. He waits hour after hour, week after week, until a time comes when the lion will let him move nearer, will permit the touch of his hand, will come forward for a piece of meat, and at last treat him like a friend, so that finally he may sit there quite at ease, and even read his newspaper, as one man did.

Lastly begins the practice of tricks: the lion must spring to a pedestal and be fed; he must jump from one pedestal to another and be fed, must keep a certain pose and be fed. A bit of meat is always the final argument, and the tamer wins (if he wins at all, for sometimes he fails) by patience and kindness.

"There is no use getting angry with a lion," said a well-known tamer to me, "and there is no use in carrying a revolver. If you shoot a lion or injure him with any weapon, it is your loss, for you must buy another lion, and the chances are that he will kill you, anyway, if he starts to do it. The thing is to keep him from starting."

I once had a talk with the lion-tamer Philadelphia on the subject of breaking lions, and heard from him what need a tamer has of patience. "I have sat in a lion's cage," said Philadelphia, "two or three hours every day for weeks, yes, for months, waiting for him to come out of his sulky corner and take a piece of meat from me. And that was only a start toward the mastery."

"Would n't he attack you?"

Philadelphia smiled. "He did at first, but that was soon settled. It is n't hard to best a lion if you go at it right. I usually carry a pair of clubs. Some men prefer a broom, because the bristles do great work in a lion's face, without injuring him. But the finest weapon you can use against a fighting lion is a hose of water. That stops his fight, only you must n't have the water too cold, or he may get pneumonia. You might n't think it, but lions are very delicate. In using the clubs, you must be careful not to strike 'em hard across the back. You 'd be surprised to know how easy it is to break a lion's backbone, especially if it 's a young lion."

In support of this statement that lions are delicate,



THE TAMER'S TRIUMPH. READING HIS NEWSPAPER IN THE LION'S CAGE.

I remember hearing old John Smith, director of the Central Park Menagerie, set forth a list of lions' ailments, and the coddling and doctoring they require. Lion medicine is usually administered in the food or drink, but there are cases requiring more heroic measures, and then the animal must be bound down before the doctors can treat him. It should be remembered that lions in city menageries are more dangerous than circus lions, since they are either wild ones brought straight from the jungle and never tamed or rebellious ones, anarchist lions that have turned against their tamers, perhaps killed them, and have finally been sold to any zoölogical garden that would take them.

"When we have to rope a lion down to doctor him," said Smith, "we drop nooses through the top bars and catch his four legs, and let down one around his body. Then we haul these fast, and there you are. You can feel his pulse or give him stuff or pull out one of his teeth or anything."

"It must be pretty hard to pull a lion's tooth," I remarked.

"Not very. Here 's the forceps I use; you see it is n't very big. This is for the upper jaw, and that other one is for the lower jaw."

I made some remark, meant to be facetious, about not giving lions gas, but the old man took me up sharply. "Certainly we give 'em gas. How else in the world do you think we operate on 'em? They get chloroform same as a person. I have a bag for it that fits over a lion's head, and pulls up tight with a string. In the bag is a sponge saturated with chloroform, and the first you know off goes Mr. Lion into quiet sleep, and you can do what you like with him. But you have to be mighty careful not to give him too much, and look sharp at his heart action, or you 'll

have a dead lion on your hands. Say, I 've found out one thing chloroforming lions that lots of doctors don't know. It 's this, that if a lion comes back hard to consciousness after you 've put him to sleep, you can help things along by catching hold of his tail and heaving him up on his head. That sends the blood down to his brain, where you want it, and pretty soon you 'll see his muscles begin to twitch, and back he comes. I told a doctor about this once, and he said he 'd done the very same thing with patients."

Coming again to the need of patience, let me quote my friend "Bill" Newman. "Why," said he, "I 've spent weeks and weeks teaching an elephant to ring a bell—just that one thing. You have to sit by him hour after hour, giving him the bell in his trunk and giving it to him again when he drops it, and then again and again for a whole morning, and then for many mornings until he gets the idea and rings it right. It 's the same way teaching an elephant to fan himself or teaching tricks to a clown elephant; you have to wait and wait, and never give up. Once an elephant understands what you want he 'll do it, but it 's awful hard sometimes making 'em understand."

"How do you teach them to stand on their heads and on their hind legs?" I asked.

"With the same kind of patience and with tackle. Just heave 'em up or roll 'em over the way they 're supposed to go and then keep at it. Some learn quicker than others. Once in a while you get a mean one, and then look out."

An instance of the affection felt for wild beasts by their tamers is offered in the case of Madame Bianca, the French tamer, who in the winter of 1900 was with the Bostock Wild Animal Show giving daily exhibitions in Baltimore, where her skill and daring with

lions and tigers earned wide admiration. It will be remembered how fire descended suddenly on this menagerie one night and destroyed the animals amid fearful scenes. And in the morning Bianca stood in the ruins and looked upon the charred bodies of her pets. Had she lost her dearest friends, she could scarcely have shown deeper grief. She was in despair, and declared that she would never tame another group; she would leave the show business. And when the menagerie was stocked afresh with lions and tigers Bianca would not go near their cages. These were lions indeed, but not *her* lions, and she shook her head and mourned for "Bowzer," the handsomest lioness in captivity, and "Spitfire," and "Juliette," and the black-maned "Brutus."

This recalls a story that Mr. Bostock told me, showing how Bianca's fondness for her lions persisted even in the face of fierce attack. It was in Kansas City, and for some days Spitfire had been working badly, so that on this particular afternoon Bianca had spent two hours in the big exhibition cage trying to get the lioness into good form. But Spitfire remained sullen and refused to do one perfectly easy thing, a jump over a pedestal.

"Ask Mr. Bostock to please come here," called Bianca, finally, quite at her wit's end, with the performance hour approaching and hers the chief act. To go on with Spitfire in rebellion would never do, for the spirit of mischief spreads among lions and tigers exactly as it spreads among children. Spitfire *must* jump over that pedestal.

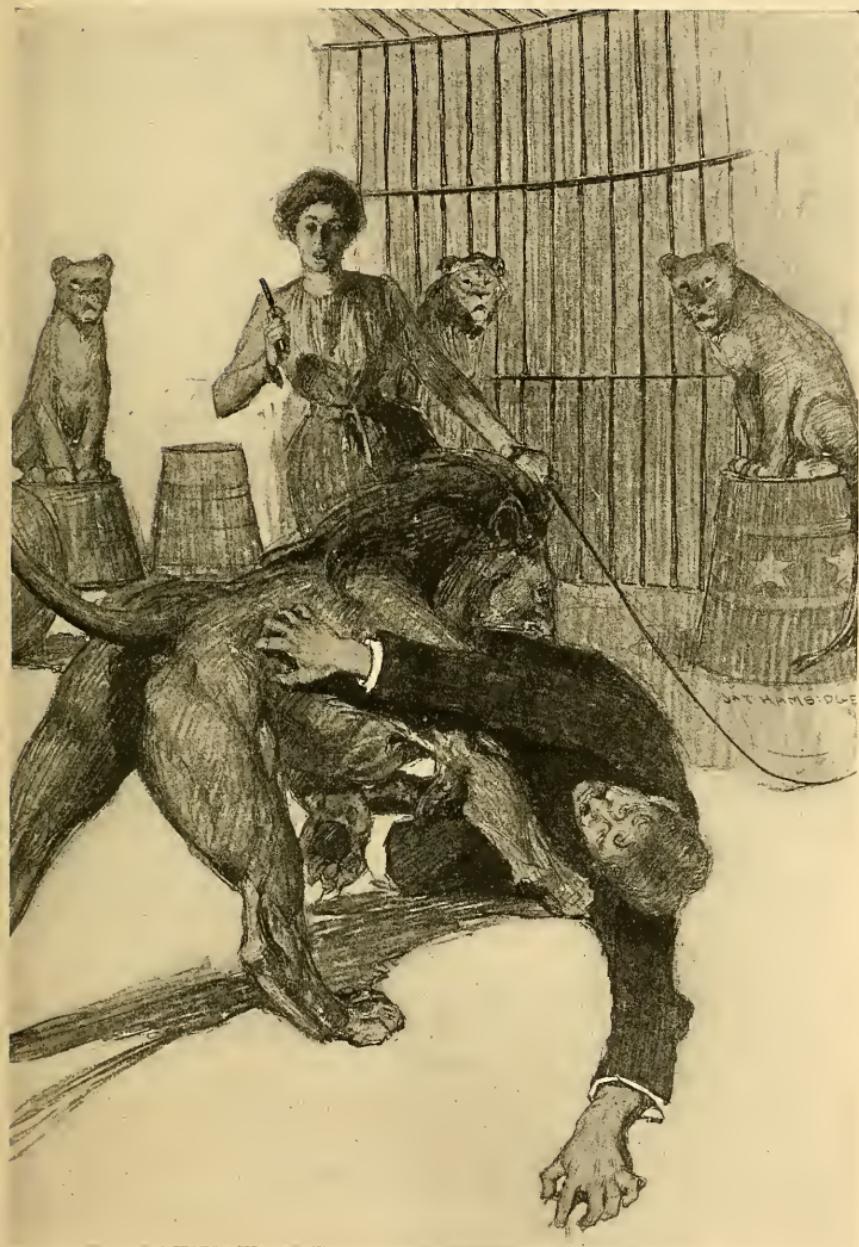
Mr. Bostock arrived presently, and at once entered the cage, carrying two whips, as is the custom. There is something in this man that impresses animals and tamers alike. It is not only that he is big and strong, and loves his animals, and does not fear them; that

would scarcely account for his extraordinary prestige, which is his rather because he *knows* lions and tigers as only a man can who has literally spent his life with them. From father and grandfather he has inherited precious and unusual lore of the cages. He was born in a menagerie, he married the daughter of a menagerie owner, he sleeps always within a few feet of the dens, he eats with roars of lions in his ears. And his principle is, and always has been, that he will enter *any* cage at *any* time if a real need calls him—which has led to many a situation like that created now by Spitfire's disobedience.

There were many groups in the menagerie at this time, each with its regular tamer; and while Bostock, as owner and director, watched over all of them, it often happened that months would pass without his putting foot inside this or that particular cage. And in the present case he was practically a stranger to the four lions and the tiger now ranged around on their pedestals in a semi-circle thirty feet in diameter, with big Brutus in the middle and snarling Spitfire at one end.

"Well," said Mr. Bostock, explaining what happened, "I saw that Bianca had made a mistake in handling Spitfire from too great a distance. She had stood about seven feet away, so I stepped three feet closer and lifted one of my whips. There were just two things Spitfire could do: she could spring at me and have trouble, or she could jump over the pedestal and have no trouble. She growled a little, looked at me, and then she jumped over that pedestal like a lady. I had called her bluff.

"The rest was easy. I put her through some other tricks, circled her around the cage a couple of times, and brought her back to her corner. Then, as she crouched there and snarled at me, I played a tattoo



BIANCA RESCUES BOSTOCK FROM "BRUTUS."

with my whip-handle on the floor just in front of her. It was just a sort of flourish to finish off with, and it was one thing too much; for in doing this I turned quite away from the rest of the group and made Brutus think that I meant to hurt the lioness. He said to himself: 'Hullo! Here 's a stranger in our cage taking a whip to Spitfire. I 'll just settle *him*.' And before I could move he sprang twenty feet off his pedestal, set his fangs in my thigh, and dragged me over to Bianca, as if to prove his gallantry. Then the Frenchwoman did a clever thing: she clasped her arms around his big neck, drew his head up, and fired her revolver close to his ear. Of course she fired only a blank cartridge, but it brought Brutus to obedience, for that was Bianca's regular signal in the act for the lions to take their pedestals; and the habit of his work was so strong in the old fellow that he dropped me and jumped back to his place.

"There was n't any more to it except that I lay five weeks in bed with my wounds. But this will show you how Bianca loved those lions: she would n't let me lift a hand to punish Brutus. Of course I called for irons as soon as I got up, and, wounded or not, I would have taught Mr. Brutus a few things before I left that cage if I could have had my way. But Bianca pleaded for him so hard—why, she actually cried—that I had n't the heart to go against her. She said it was partly my own fault for turning my back,—which was true,—and that Brutus was a good lion and had only tried to defend his mate, and a lot more, with tears and teasing, until I let him off, although I knew I could never enter Brutus's cage again after leaving it without showing myself master. That 's always the way with lions: if you once lose the upper hand you can never get it back."

III

BONAVITA DESCRIBES HIS FIGHT WITH SEVEN
LIONS AND GEORGE ARSTINGSTALL TELLS
HOW HE CONQUERED A MAD
ELEPHANT

IN the course of days spent with Mr. Bostock and his menagerie, I observed many little instances of the tamer's affection for his animals. I could see it in the constant fondling of the big cats by Bostock himself, and by Bonavita, his chief tamer, and even by the cage grooms. And no matter how great the crush of business, there was always time for visiting a sick lioness out in the stable, who would never be better, poor thing, but should have all possible comforts for her last days. And late one afternoon I stood by while Bonavita led a powerful, yellow-maned lion into the arena cage and held him, as a mother might hold a suffering child, while the doctor, reaching cautiously through the bars, cut away a growth from the beast's left eye. It is true they used a local anesthetic; but even so, it hurt the lion, and Bonavita's position as he knelt and stroked the big head and spoke soothing words seemed to me as far as possible from secure. Yet it was plain that his only thought was to ease the lion's pain.

"I could n't have done that with all my lions," Bonavita said to me after the operation; "but this one is specially trained. You know he lets me put my head in his mouth."

Bonavita is a handsome, slender man, with dark hair and eyes, quite the type of a Spanish gentleman; and I liked him not only for his mastery of twenty-odd lions, but because he had a gentle manner and was modest about his work. According to Mr. Bostock, Bonavita has but two strong affections: one for his old mother, and one for his lions. Occasionally I could get him aside for a talk, and that was a thing worth doing.

"People ask me such foolish questions about wild beasts," he said one day. "For instance, they want to know which would win in a fight, a lion or a tiger. I tell them that is like asking which would win in a fight, an Irishman or a Scotchman. It all depends on the particular tiger you have and the particular lion. Animals are just as different as men: some are good, some bad; some you can trust and some you can't trust."

"Which is the most dangerous lion you have?" I inquired.

"Well," said he, "that 's one of those questions I don't know how to answer. If you ask which lion has been the most dangerous so far, I should say Denver, because he tore my right arm one day so badly that they nearly had to cut it off. Still, I think Ingomar is my most dangerous lion, although he has n't got his teeth in me yet; he 's tried, but missed me. It does n't matter, though, what I think, for it may be one of these lazy, innocent-looking lions that will really kill me. They seem tame as kittens, but you can't tell what 's underneath. Suppose I turn my back and one of them springs—why, it 's all off."

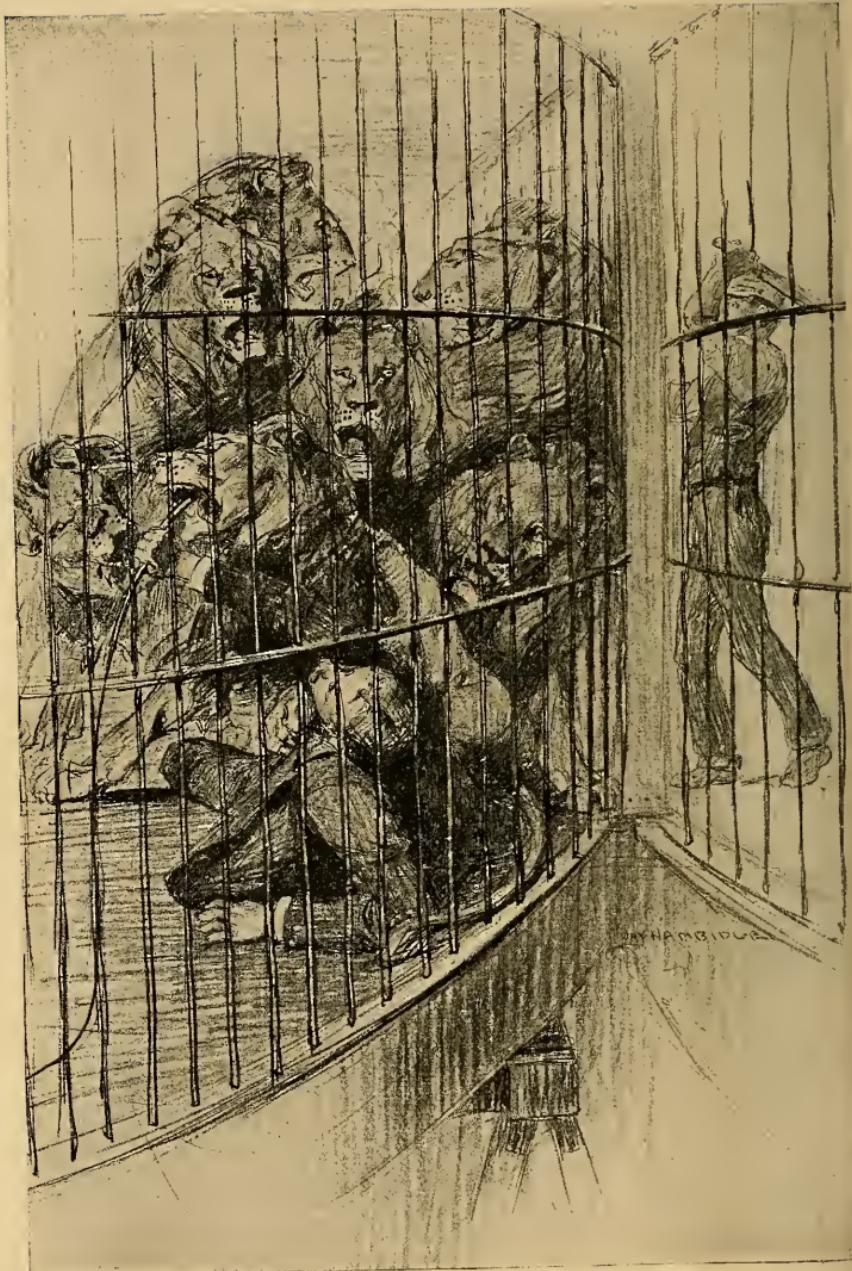
Another day he said: "A man gets more confidence every time he faces an angry lion and comes out all right. Finally he gets so sure of his power that he

does strange things. I have seen a lion coming at me and have never moved, and the lion has stopped. I have had a lion strike at me and the blow has just grazed my head, and have stood still, with my whip lifted, and the lion has gone off afraid. One day in the ring a lion caught my left arm in his teeth as I passed between two pedestals. I did n't pull away, but stamped my foot and cried out, 'Baltimore, what do you mean?' The stamp of my foot was the lion's cue to get off the pedestal, and Baltimore loosed his jaws and jumped down. His habit of routine was stronger than his desire to bite me."

Again, Bonavita explained that there is some strange virtue in carrying in the left hand a whip which is never used. The tamer strikes with his right-hand whip when it is necessary, but only lifts his left-hand whip and holds it as a menace over the lion. And it is likely, Bonavita thinks, that to strike with that reserve whip would be to dispel the lion's idea that it stands for some mysterious force beyond his daring.

"You see, lions are n't very intelligent," said he; "they don't understand what men are or what they want. That is our hardest work—to make a lion understand what we want. As soon as he knows that he is expected to sit on a pedestal he is willing enough to do it, especially if he gets some meat; but it often takes weeks before he finds out what we are driving at. You can see what slow brains lions have, or tigers either, by watching them fight for a stick or a tin cup. They could n't get more excited over a piece of meat. One of the worst wounds I ever got came from going into a lion's den after an overcoat that he had dragged away from a foolish spectator who was poking it at him."

I finally got Bonavita to tell me about the time when



BONAVITA'S FIGHT WITH SEVEN LIONS IN THE RUNWAY.

the lion Denver attacked him. It was during a performance at Indianapolis, in the fall of 1900, and the trouble came at the runway end where the two circular passages from the cages open on an iron bridge that leads to the show-ring. Bonavita had just driven seven lions into this narrow space, and was waiting for the attendants to open the iron-barred door, when Denver sprang at him and set his teeth in his right arm. This stirred the other lions, and they all turned on Bonavita; but, fortunately, only two could reach him for the crush of bodies. Here was a tamer in sorest need, for the weight of the lions kept the iron doors from opening and barred out the rescuers. In the audience was wildest panic, and the building resounded with shouts and screams and the roars of angry lions. Women fainted; men rushed forward brandishing revolvers, but dared not shoot; and for a few moments it seemed as if the tamer was doomed.

But Bonavita's steady nerve saved him. As Denver opened his jaws to seize a more vital spot, the tamer drove his whip-handle far down into his red throat, and then, with a cudgel passed in to him, beat the brute back. The other lions followed, and this freed the iron door, which the grooms straightway opened, and in a moment the seven lions were leaping toward the ring as if nothing had happened. And last of the seven came Denver, driven by Bonavita, white-faced and suffering, but the master now, and greeted with cheers and roars of applause. No one realized how badly he was hurt, for his face gave no sign. He bowed to the audience, cracked his whip, and began the act as usual. As he went on he grew weaker, but stuck to it until he had put the lions through four of their tricks, and then he staggered out of the ring into the arms of the doctors, who found him torn with

ugly wounds that kept him for weeks in the hospital. That, I think, is an instance of the very finest lion-tamer spirit.

Among various meetings with tamers of animals, I recall with particular pleasure one afternoon when my friend Newman brought to see me a tamer famous in his day—George Arstingstall. I knew that Arstingstall was the first man in this country to work lions, tigers, leopards, elephants, sheep, monkeys, and various other beasts all in a great circular cage. Also that his fame had spread across Europe and his daring feats been shown from London to Moscow; but I did not know what a simple, modest man he was, nor realize until then the charm of listening to a couple of circus veterans, comrades for years, talking of the old stirring days. Here were two men getting on to sixty, yet talking with the eagerness of boys about their exploits and perils under fang and claw.

It was: “Say, Bill, do you remember when that bull pup caught Topsy by the trunk and stampeded the—”

“Stampeded the whole business. Do I remember, George? Up in Boston. Bing! bang! over the Common, and the Old Man wild! Well I guess. But, say, George, that was n’t as bad as the stampede in Troy, when those four elephants cleaned out the rolling-mill. Oh, what a night! Let ’s see. There was Nan and—”

“And Tip.”

“Yes, poor old Tip. I strangled him at Bridgeport. You remember, George, he would n’t take the poison. Oh, he was no fool, Tip was n’t, and I told the Old Man we ’d have to put nooses on him and cut off his wind.”

“I know, Bill, the Old Man said it was n’t possible to strangle an elephant—”

“And say, George, I had his wind shut off inside of three minutes after the boys began to haul. Oh, you can’t beat three sheave-blocks, George, for finishing off a bad tusker. Well, this night in Troy those four elephants went sailing through this rolling-mill, trumpeting like mad, right over the hot iron, scaring those Irishmen blue, and then smashed down a steep refuse bank into the mud. Oh, what looking elephants! Nan had her legs all burned, and—”

“I know, and say, Bill, do you remember where I found Tip? Three miles out of Troy, standing up in a corn-field sound asleep, and two little boys on a rail fence looking at him. He ’d knocked over a shanty and smashed open a barrel of whisky—a whole barrel, Bill—and there he was sound asleep. When I saw those little boys I made up my mind I ’d found Tip.

“‘What ye lookin’ at, little boys?’ I sung out.

“‘El’phunt, mister,’ says one of the boys, sort of careless like, just as if it was a common thing in Troy for elephants to be asleep in corn-fields.”

“I know, that ’s the way little boys act,” remarked Newman, sagaciously. “Say, George, tell about the time you took that car-load of animals over the Alleghanies.”

After some preliminaries, Mr. Arstingstall responded to the invitation, and I heard a story that Victor Hugo might have turned into a masterpiece of description.

It was back in the winter of 1874, and circus trains were not fitted up as completely then as they are to-day. Arstingstall was in charge of a car packed with a medley of animals—lions and tigers in cages, some camels, some boxes of monkeys, some hyenas, a sacred bull from Tibet, and a young male elephant recently brought from Africa and as yet untrained. All these were on their way to Wisconsin, where the show was to make

its spring opening in a couple of weeks, during which Arstingstall was expected to break the young elephant for driving in a chariot race.

At one end of the car was a stove against the bitter weather, but the elephant was chained at the other end, and as they came into the mountain region Arstingstall noticed that the elephant was suffering from cold, and at the first stop sent a man out for half a bucket of whisky, which he filled up with water and gave to the shivering animal. There is no use giving an elephant whisky unless you give him enough.

Now came a run of an hour and a half without stop, and during this time Arstingstall was alone in the animal-car, and about as busy as he ever expects to be on this earth. The trouble began when he unloosed the elephant's chains to lead him nearer the stove, for it looked as if his ears might freeze, as happens. Indeed, an elephant's ears will sometimes freeze so hard that big pieces drop off, while a frozen tail has been known to drop off entirely.

Against such chances Arstingstall wished to take precautions, so he led the elephant down the car, through the jumble of animals and cages, all the less prepared for mischief as this was rather a smallish elephant, not over six feet at the shoulder and showing only half-grown tusks. But they were sharp. Whether it was the whisky taking violent effect or some sudden hatred for his keeper—at any rate, that elephant, long before he reached the stove, set forth upon a murderous campaign the like of which Arstingstall had never known. Before he realized the danger, he felt the creature's trunk twisting around his neck, and he was hurled violently to the floor. There he lay helpless, while the elephant hesitated, one might fancy,

whether to kneel on him and crush the life out or run him through with his tusks.

In that moment's pause Arstingstall made a last despairing effort, did the only thing he could do, sunk his teeth into the fleshy finger that curls around the end of an elephant's trunk and covers the opening so that no invading mouse may enter and work destruction. In all an elephant's great body, there is no spot so sensitive as this finger, and, with a scream of pain, the animal loosed his hold, whereupon Arstingstall sprang behind one of the cages. But the elephant was after him in a moment, swinging his trunk and trumpeting black murder. Arstingstall dodged behind the camels, behind the sacred bull, behind the stove. The elephant followed him everywhere, profiting by his smallness, and where he could not go himself he sent his curling trunk. Arstingstall, out of breath, climbed on top of the lion's cage, thinking to find some respite, but the red-ended trunk pursued him. Once more he tried biting tactics, and as the reaching finger swept along the cage top he seized it again in his teeth, and this time took a piece clean out of it, which was not pleasant for him, and less so for the elephant.

Now came a truce of some minutes, during which the elephant put forth screaming challenges, but kept at a distance, and allowed Arstingstall to reach the bunks beside the monkeys' cages. From the topmost bunk opened a trap-door in the car roof, the only exit, as the sliding side-doors were bolted. He might escape here to the back of the train, but that would leave a mad elephant in possession of the car, a thing not to be thought of. Thus far the elephant's rage had been directed solely against his keeper, but, the keeper gone, he might turn to destroying the other animals, might

kill the sacred bull, or smash open the lions' cages—there was no telling what he might do. Arstingstall saw that his duty lay in that car. Whatever came, he must—

Crash! came the elephant again, and the lower berth was a wreck. And now the din became infernal with the roaring and bellowing and chattering of the other animals. Arstingstall did some quick thinking. There was sure death before him, unless he could somehow conquer this frenzied creature, whose rushes, coming harder and harder, must soon batter down the car, for all its stout oak timbers. Oh, for a weapon, a prod of some sort, a—like a flash the thought came; down at the other end was the pitchfork used for throwing fodder. There was his chance; he must get that pitchfork.

For the next hour it was a fight, man against elephant, for the winning and holding of that pitchfork. There was the whole story, and some day I hope to give its details, the moves and counter-moves, the strategy of brute against human, the conflict of brain against crude force. Arstingstall won, but by what patience and quiet nerve he alone knows. Foot by foot, cage by cage, he worked his way down the length of that car, the elephant now on the defensive, one would say, as if he realized what was planning, the man watching, resolute, biding his time, ready for a sudden rush, forced now and again to use his teeth upon that murderous trunk.

Finally, he got the pitchfork, and for a moment—what a moment that was!—held four prongs of flashing steel before the elephant's eyes, red-burning, unsubmissive. It was all over now, the battle was won, the animal knew, and stood still awaiting the blow. Down came the weapon, and right through the trunk went

those four sharp points, down into the timbers under foot. Then Arstingstall braced the handle under a wall-beam, so that the elephant was nailed fast to the floor, nose down. And then the brute squealed his submission.

Three weeks later Arstingstall drove that elephant, perfectly broken, in a chariot race, and for years after there was not a better little bull in the herd than he.

IV

WE SEE MR. BOSTOCK MATCHED AGAINST A
WILD LION AND HEAR ABOUT THE
TIGER RAJAH

WHENEVER I made the round of cages with Mr. Bostock I was struck by the fierce behavior of a certain male lion with brown-and-yellow mane,—“Young Wallace,” they called him,—who would set up a horrible snarling as soon as we came near, and rush at the bars as if to tear them down. And no matter how great the crowd, his wicked yellow eyes would always follow Bostock, and his deep, purring roar would continue and break into furious barks if the tamer approached the bars. Then his jaws would open and the red muzzle curl back from his tusks, and again and again he would strike the floor with blows that would crush a horse.

“Does n’t love me, does he?” said Bostock, one day.
“What’s the matter with him?” I asked.

“Why, nothing; only he’s a wild lion—never been tamed, you know; and I took him in the ring one day. He has n’t forgotten it—have you old boy? Hah!” Bostock stamped his foot suddenly, and Young Wallace crouched back, snarling still, a picture of hatred and fear.

“Yes,” went on Bostock, “he’s wild enough. You see, after the fire, I had to get animals from pretty much everywhere, and get ‘em quick. Did some lively cabling, I can tell you; and pretty soon there were

lions and tigers and leopards and—oh, everything from sacred bulls down to snakes, chasing across the ocean, and more than half of them had been loose in the jungle six months ago. It was a case of hustle, and we took what they sent us. Then we had fun breaking 'em in. Ask Madame Morelli if we did n't. She 's in the hospital now from the claws of that fellow." He pointed to a sleepy-looking jaguar.

"Tell you how I came to take this wild lion into the ring. I had a press-agent who had been announcing out West what a wonder I was with wild beasts, and how I was n't afraid of anything on legs, and so on. That was all very well while I was in Baltimore; but when I joined my other show after the fire, of course I had to live up to my reputation. And when they got up a traveling men's benefit out in Indianapolis and asked me to go into the ring with Young Wallace, why, there was n't anything to do but go in. It was n't quite so funny, though, as it seemed, for I might as well have taken a lion fresh from the wilds of Africa." Mr. Bostock smiled at the memory.

"Well, I did the thing, and got through all right. Young Wallace has n't forgotten what happened to him. I got the best of him by a trick: had a little shelter cage placed inside the big arena cage, and at first I stood in the small one, and let the lion come at me. Oh, you 'd better believe he came! I thought sure he 'd jump clean over the thing and land on me; for there was no roof to my cage—only sides of wire netting. He did n't quite do it, though; and as soon as I saw he was getting rattled I stepped out quick and went at him hard with whip and club. And I drove him all over the ring, and the people went crazy, for he was the maddest lion you ever saw.

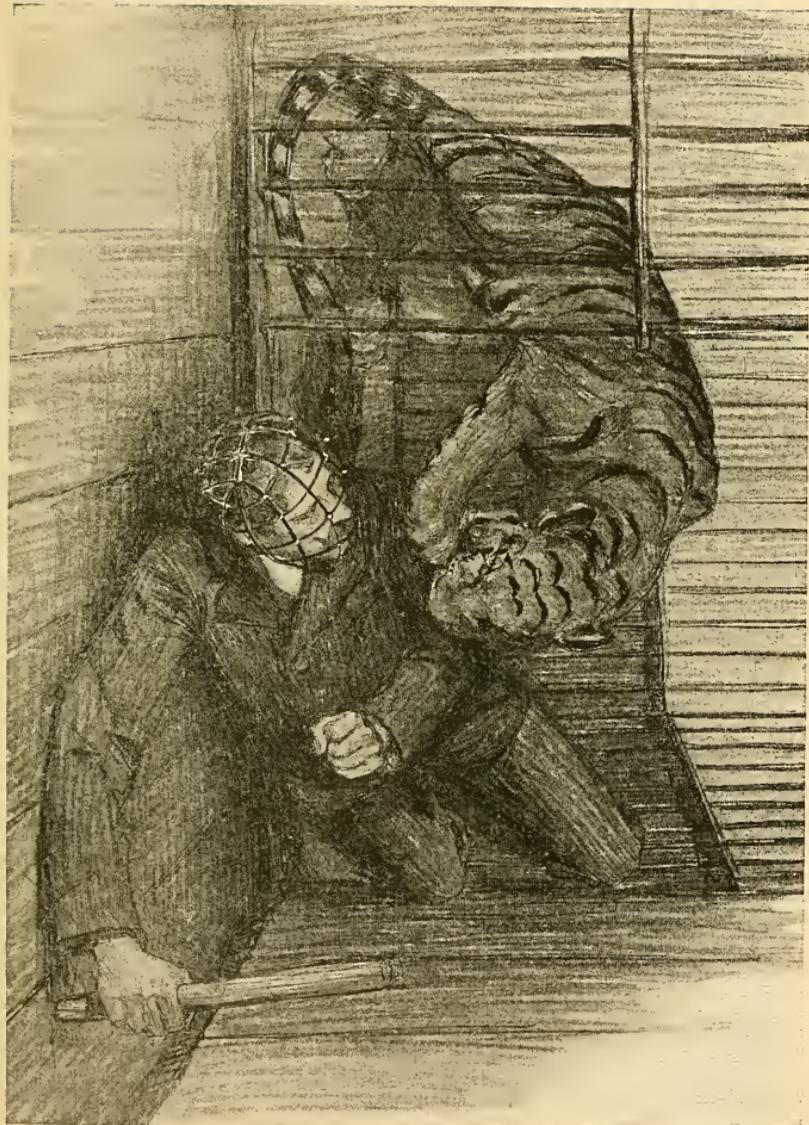
"That was all right as far as it went, but the people

wanted more. They got to be out-and-out bloodthirsty there in Indianapolis. Wanted me to go in the ring with Rajah, that big tiger. See, over there! Come up, Rajah. Beauty, is n't he? Does n't pay any special attention to me, does he? Nearly killed me, just the same. Look!" He lifted his cap and showed wide strips of plaster on his head.

"Point about Rajah was that he 'd killed one of my keepers a couple of weeks before. Poor fellow got in his cage by mistake. And now these Indianapolis folks wanted to see me handle him. Between you and me, this keeper was n't the first man Rajah had killed, and I did n't care much for the job. As for my wife—well, you can imagine how *she* felt when she heard I was going in with Rajah.

"On the morning of the performance I decided to have a rehearsal, and called on a few picked men to help me. I knew by the way he had killed his keeper that Rajah would go at my head if he attacked me at all, so I rigged up a mask of iron wire, and wore this strapped over my head like a little barrel. Then I drove him into the arena and began, while the others looked on anxiously.. It 's queer, sir, but that tiger went through his tricks as nice as you please, back and forth, up on his pedestal and down again, everything just as he used to do in the old days before he went bad. Never balked, never turned on me; just as good as gold.

"Soon as I was satisfied I drove him across the bridge and down the runway toward his den. I came about a dozen feet behind him, carrying a long wooden shield, as we generally do in a narrow space. Rajah reached his cage all right, and went in. You see, he could n't go down the runway any farther, for the door opening outward barred the passage. Behind that door I had



"RAJAH'S" ATTACK UPON BONAVITA IN THE RUNWAY.

stationed a keeper, with orders to close it as soon as Rajah was inside; but Rajah went in so silently that the keeper did n't know it, the peep-holes in the door being too high for him to see very well. The result was that the cage door stood open for a few seconds after the tiger had gone in. It seems a little thing, but it nearly cost me my life; for when I came up Rajah's head was right back of the open door, and when I reached out my hand to close the door he sprang at me, and in a second had me down, with his teeth in my arm and his claws digging into my head through openings in the mask.

"Then you 'd better believe there was a fight in that runway! The keepers rushed in; Bonavita rushed in. They shot at him with revolvers, they jabbed him with irons, they pounded at him with clubs; and one of the blows that Rajah dodged knocked me senseless. Well, they got me out finally. I guess the mask saved my life. But I did n't take Rajah into the ring that evening, and Rajah won't be seen in the ring any more. He 's made trouble enough. Why, the things I could tell you about that tiger would fill a book."

Some of these things he did tell me, for I brought the talk back to Rajah whenever the chance offered. I well remember, for instance, the occasion when I heard how Rajah once got out of his cage and chased a quagga—one of those queer little animals that are half zebra and half mule. It was late at night, and we had entered the runway, Mr. Bostock and I, after the performance, for he wanted me to realize the perils of this narrow boarded lane that circles all the dens and leads the lions to the ring. It is indeed a terrifying place—a low, dimly lighted passage, curving constantly, so that you see ahead scarcely twenty feet, and are always turning a slow corner, always peering ahead

uneasily and listening! What is that? A soft tread? The glow of greenish eyeballs? Who can tell when a bolt may slip or a board give way? So many things have happened in these runways! Of course a lion has no business to be out of his den, but—but suppose he is? Suppose you meet him—now—there!

Well, it was here that I heard the story. Bonavita, it appears, was standing on the bridge one morning when there arose a fearful racket in the runway, and, looking in, he saw the quagga tearing along toward him. He concluded that some one had unfastened the door, and was just preparing to check the animal, when around the curve came Rajah in full pursuit. Bonavita stepped back, drew his revolver, and, as the tiger rushed past, fired a blank cartridge, thinking thus to divert him from the quagga. But Rajah paid not the slightest heed, and in long bounds came out into the arena hard after the terrified quadruped, which was galloping now with the speed of despair. A keeper who was sweeping clambered up the iron sides and anxiously watched the race from the top. Bonavita, powerless to interfere, watched from the bridge.

Of all races ever run in a circus this was the most remarkable. It was a race for life, as the quagga knew and the tiger intended. Five times they circled the arena, Rajah gaining always, but never enough for a spring. In the sixth turn, however, he judged the distance right, and straightway a black-and-yellow body shot through the air in true aim at the prey. Whereupon the quagga did the only thing a quagga *could* do—let out both hind legs in one straight, tremendous kick; and they do say that a quagga can kick the eyes out of a fly. At any rate, in this case a pair of nervous little heels caught the descending tiger squarely under the lower jaw, and put him to sleep like a nice little



THE TIGER "RAJAH" KICKED BY THE QUAGGA.

lullaby. And that was the end of it. The quagga trotted back to its cage, Bonavita put up his revolver, the frightened sweeper climbed down from the bars, and Rajah was hauled back ignominiously to his den.

Here we have three instances showing the extreme importance of little things in a menagerie. A keeper opens door No. 13 instead of door No. 14, and is straightway killed. A screw is loose in a bolt fastening, and, presto! a tiger is at large. A watcher at a peep-hole looks away for a moment, and a life goes into jeopardy. It is always so; and I will let Mr. Bostock tell how a little thing gave Rajah his first longing to kill.

"It was several years ago," said he, "when I was running a wagon show in England. I remember we were about a mile and a half out of a certain town when this thing happened. For some reason Rajah had been transferred to a bear-wagon, and we ought to have examined it more carefully, for bears are the worst fellows in the world to damage a cage by ripping up the timbers; it seems as if nothing can resist their claws and teeth. And this particular cage was in such bad shape that Rajah managed to get out of it. I knew something must be wrong when I saw the big elephant-wagon that headed the procession go tearing away with its six horses on a dead run under the driver's lash. No wonder the driver was scared, for he had turned his head and seen the two draft-horses that followed him down on the ground, with Rajah tearing at one of them, and the other one dead.

"It was n't a pretty sight when we got there, and it was n't an easy job, either, capturing Rajah. I don't know what we should have done if it had n't been for a long-haired fellow in the show called 'Mustang Ned,' who came up with a coil of rope and lassoed the tiger.

Then we tangled him up in netting, and finally got him into one of the shifting-cages. But after that he was never the same tiger. You would n't think there was a time when Rajah used to ride around the tent on an elephant's back, with only a little black boy to guard him!"

"What, outside the iron ring?"

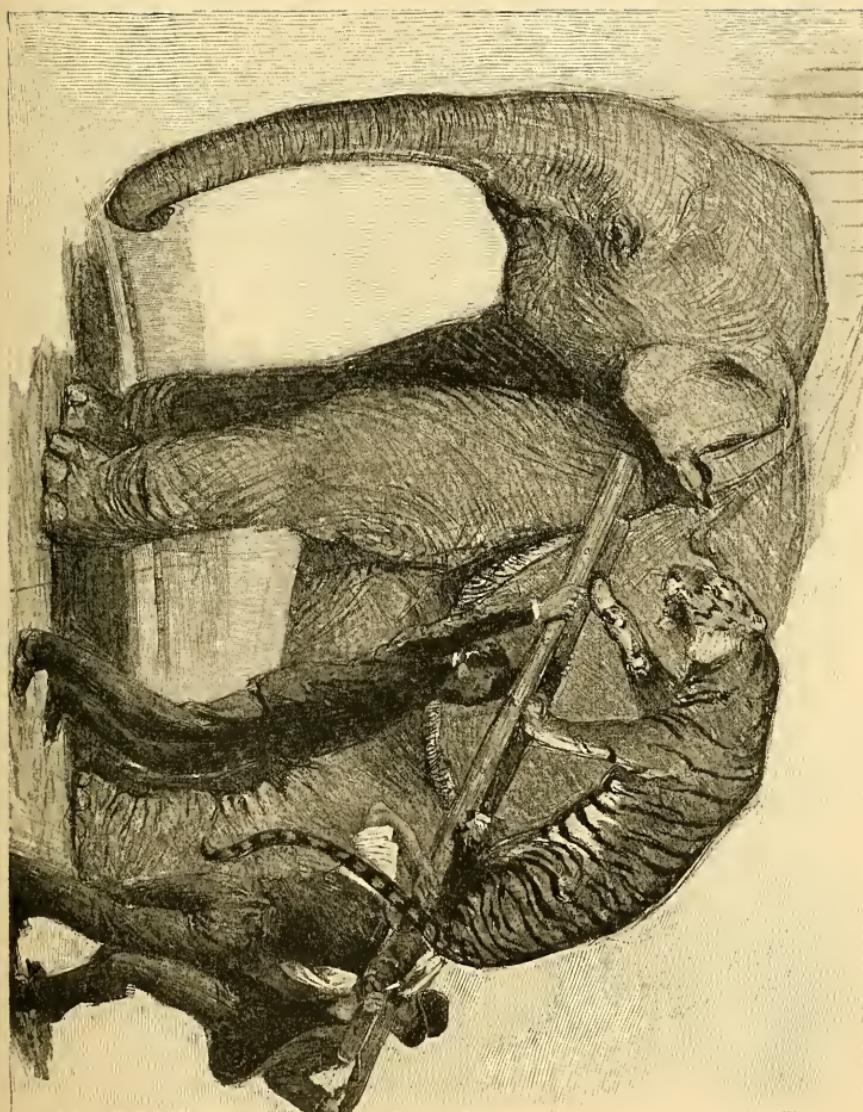
"Yes, sir, right among the women and children. He did that twice a day for over a year. Might be doing it yet if the black boy had n't been so careful of his white trousers."

"His white trousers?"

"That 's right. You see, this boy rode on the elephant, behind Rajah, and he wore long black boots and a fine white suit. Made quite a picture. Only he did n't like to rub his trousers against the tiger, for an animal's back is naturally oily; so he used to tuck his legs under a lion's skin that Rajah rode on, and wrap it around him like a carriage-robe.

"Well, one day as they were going around the nigger lost his balance and tumbled off the elephant, pulling the lion's skin with him, and of course that dragged Rajah along, too. The first thing we knew, there was a big tiger on the ground, and people running about and screaming. Pleasant, was n't it?

"In another minute we 'd have had a panic; but by good luck I was there, and caught Rajah quickly around the neck and held him until the others got a rope on him. Then we had a time getting him back on the elephant. First I tried to make him spring up from a high pedestal, but he would n't spring. Next I had them work a ladder under Rajah, so that he sat on it; and then, with two men at one end and me at the other, we lifted him slowly level with our shoulders, level with our heads, and just there the tiger gave a vicious growl,



and the two men lowered their end. That made him work up toward my end, and in a second I had Rajah's face close to my face, and both my hands occupied with the ladder. I could n't do a thing, and the only question was what *he* would do. He looked at me, looked at the elephant, and then struck out hard and quick, missing me only by a hair; in fact, he did n't miss me entirely, for one of his claws just reached the corner of my eye—see, I have the scar still. But he jumped on the elephant, and we kept the mastery that day. Still, it was bad business, and I saw we could n't take such chances again. 'That was Rajah's last ride.'

V

WE SPEND A NIGHT AMONG WILD BEASTS
AND SEE THE DANGEROUS LION
BLACK PRINCE

THE general opinion among wild-beast tamers is that the tiger is more to be feared than the lion. The one will kill a man as easily as the other, but the lion gives fair warning of his murderous intention by rushing at his victim with a roar, whereas the tiger, true representative of the cat tribe, sneaks up with semblance of affectionate purr, only to set his fangs suddenly into the very life of his victim. The lion has somewhat greater muscular power than the tiger, but the latter has greater quickness.

The tamer Philadelphia told me once that he had seen a lion fasten his fangs in the shoulder of a dead horse and drag the carcass, weighing perhaps a thousand pounds, a distance of twenty feet. If a lion and a strong horse were to pull in opposite directions, the horse would drag the lion backward with comparative ease; but if the lion were hitched behind the horse, facing in the same direction, and were allowed to exert his strength in backing, he could easily pull the horse down upon his haunches, so much greater is his strength when exerted backward from the hind legs than in forward pulling.

A lion springing through the air from a distance of six feet would knock down a horse or bullock with a single blow of his forearm, backed by the momentum

of his three hundred pounds' weight, and a full-grown lion in the jungles will jump twenty-five or thirty feet on the level from a running start. In captivity the same lion would clear a distance about half as great. A lion can jump over a fence eight or ten feet high, but not at a bound. He catches first with his fore-legs, and drags his body after him. Tigers will jump a trifle higher than lions. But of all wild animals, the leopards are the greatest jumpers, being able to hurl their lithe and beautiful bodies, curled up almost into a ball, to extraordinary heights. They bound with ease, for instance, from the floor of the cage so as to touch a ceiling twelve feet high.

For a short distance a lion or a tiger will outrun a man, and can equal the speed of a fast horse, but they lose their wind at the end of half a mile at the most. They have little endurance, and are remarkably weak in lung power. Their strength is the kind which is capable of a terrific effort for a short time. It would take six men, for instance, to hold a lion down in his first struggles, even after his legs were tied.

One day Philadelphia, wishing to test the affection popularly supposed to exist between a lion and a mouse, put a mouse in the cage of a full-grown Nubian lion. The lion saw the mouse before it was fairly through the bars, and was after him instantly. Away went the little fellow, scurrying across the floor and squealing in fright. When he had gone about ten feet, the lion sprang, lighting a little in front of him. The mouse turned, and the lion sprang again. This was repeated several times, the mouse traversing a shorter distance after each spring of the lion. It was demonstrated that a lion is too quick for a mouse, at least in a large cage.

Finally the mouse stood still, trembling, while the

lion studied it with interest. Presently he shot out his big paw, and brought it down directly on the mouse, but so gently that the little fellow was not injured in the least, though held fast between the claws. Then the lion played with him in the most extraordinary way, now lifting his paw and letting the mouse run a few inches, now stopping him as before. Suddenly the mouse changed his tactics, and, instead of running when the lion lifted his paw, sprang into the air straight at the lion's head. The lion, terrified, gave a great leap back, striking the bars with all his weight, and shaking the whole floor. Then he opened his great jaws and roared and roared again, while the little mouse, still squealing, made his escape. Of the two, the lion was the more frightened.

Speaking of Philadelphia, I used to wonder, as I watched him manage Black Prince on horseback, whether the lion was really in earnest as he struck and roared with such apparent viciousness, or whether he had simply been trained to play a part. Certainly the lion looked as if his one desire was to kill the little man who teased him so with rod and whip, smiling all the time under his yellow mustache.

One night Black Prince sprang ten feet through the air straight at Philadelphia, who saved his life by dodging, but did not escape the sweep of the lion's forearm. No one knew that, however, for the tamer showed no sign of injury, but brought his heavy whip down with a stinging cut over the lion's head, and went through the "act," holding a handkerchief to his face now and then, but smiling as before. When he left the ring, it was found that one of the lion's claws had laid his cheek open almost from eye to lip.

"He meant to kill me that trip," said Philadelphia, as they bound up his face.

"We will never show that lion again," declared the manager, much excited.

"Oh, yes, we will!" answered the wounded tamer. "I will make him work to-morrow as usual." And he did, teasing and prodding him that day as never before, as if daring him to do his worst.

The climax was reached one night in January, when Black Prince came within an ace of killing this daring tamer, and certainly would have done so had not his attention been diverted just at the critical moment by the horse he was riding. He paused in the very act of springing, as if undecided whether to destroy the man or the horse, and that pause put the tamer on his guard, while the watchful grooms rushed in through the iron gates and drove Black Prince from the ring.

Speaking to me afterward of that night, Philadelphia said: "I knew the critical moment had come, and that it would not do to push matters any farther. If I had made Black Prince do his jump when he balked and turned on me, he would have sprung at my throat, caught me between his fore paws, and fastened his fangs in my neck or breast. It would have been impossible for ten men to have dragged him off, and I should have been killed there in the sight of the spectators, just as my nephew, Albert Krone, was killed in Germany some years ago by a Russian bear."

In conclusion, let me recall a night that I spent among the wild beasts of the famous Hagenbeck menagerie. That, by the way, is a thing worth doing if one values strange sensations.

It is two hours after midnight. The snow lies crisp under foot, the stars and electric lights shine quietly in the still night. Before me rises a big building, its walls pictured with springing lions and pyramids of tigers. As I enter, a long roar from within tells me

that the animals are not all asleep. The roar, a lion's, comes three times with increasing volume, and at the fourth is answered by another of equal volume; then two lions roar together, the sounds coming quicker and quicker, with an increasing staccato that ends finally in hoarse barks.

Taking a little alarm-clock that the night watchman loans me, I go back among the cages, where I am to keep strange vigil. A small wooden door at the right takes me into an open space ranged with cages and wagons, the former containing some barking dogs. From here I pass into a circular shed, where are more wagons and dogs, and at the farther end by the wet, sticky-looking seals I reach a small door leading into a low passage, beyond which are the wild beasts.

I push aside a curtain covering the entrance against drafts, and see before me a picture never dreamed of by humdrum New-Yorkers sleeping within stone's throw. The cages, ranged in double row, form an alleyway, divided at intervals by gas-stoves, on which water is heating. In front of the big group of lions and tigers sleeps one of the grooms, stretched on a cot bed. He wears a pink shirt and blue drawers, and his bare feet are turned to the gas-stove, which burns night and day. Another groom sleeps farther on, beside the Tibet goats, and still another near the ponies, opposite the small cage of the lioness Mignon. They sleep so soundly that a riot would scarcely waken them; yet, by some subtle sense, they would be on the alert in an instant if anything were wrong in the cages.

Three animals rouse themselves as I step into the darkness which shrouds the big cage—the lion Yellow Prince is one of them—and as I approach the bars three pairs of burning eyes glare at me through the shadows. I venture to turn on the electric light and peer into

the cage. Here are three leopards, the three royal Bengal tigers, and a full-grown lion, making no more noise between them than a sleeping child.

I return to the farther end of the shed, where the five-year-old lioness Helena, alone in her cage, is walking back and forth drowsily, as if on the point of dropping off for her night's rest. Indeed, she does this presently, turning on her side, and stretching her legs out perfectly straight, with no bend at the joints. It was Helena who, in a fit of nervous fright a year or two ago, sprang upon Betty Stuckart, the famous prize beauty, and nearly killed her. Since then she has lived in solitary confinement.

The stillness now would be absolute but for a very curious sound, which comes out of the gloom beyond the big cage of leopards and tigers. It is the elephant Topsy sleeping. There is no stranger sight in a menagerie than that of an elephant asleep. The huge legs are bent to right angles at the knees, the trunk is curled into the mouth, and the whole suggests a shapeless mound of mud or clay, or a half-inflated balloon. Head and tail are alike; the ears lie flat; the eyes are quite concealed in wrinkled flesh, but from somewhere within this seemingly dead mass comes a long, hissing sound, like the exhaust from a steam-pipe. This sound continues for several seconds and then stops, to be repeated after an interval of silence.

So complete is the illusion of the sleeping elephant's not being alive at all, but only a mound of dead matter, that, abstractedly, I set the alarm-clock down upon the flat bone of the forehead. No sooner have I done so than I spring back startled, leaving the clock ticking on the elephant's head. There has been no noise or movement, no indication of displeasure, no effort to do



A ROYAL BENGAL TIGER.

me harm. But suddenly, in the middle of the huge, mud-colored mass there has appeared a round, red circle about two inches in diameter. The elephant has simply opened his eye. The eye does not roll, or move, or wink. It merely remains open on me for a few seconds, a round, staring circle, and then disappears as suddenly as it came.

Leaving Topsy, I resume my wanderings among the cages. The whole place is asleep, and I am seized with intense desire to awaken something. I take a long straw, and tickle Black Prince on his black nose. His eyes open instantly, and the heavy paw swings round like the working-beam of an engine, only more quickly, to crush the straw for its impertinence. I tickle him again, and again he strikes, with force enough to knock down a horse. As I continue, his blows grow quicker and heavier, and his big tusks snap at the troublesome straw. Finally, in desperation, he starts up, and, throwing back his magnificent head, looks at me out of his brown, wicked eyes, lifts his chin, curls down his lower lip a little, and bellows forth a low, plaintive sound, more like the mooing of a cow than the roar of a lion. Then, apparently ashamed of this uninspiring sound, he shakes his mane and roars in genuine lion fashion.

So the hours of the night pass, and at last, having seen everything and grown weary of experiments, I seat myself on a trunk near Black Prince's cage, and am soon buried in my meditations. The tips of the tigers' noses begin to change from red to green, and then back again; the leopards' tails are no longer straight, but end in snake-heads with forked tongues darting out. I overhear curious conversations among the lions, and presently men in blue shirts and pink drawers come marching past, each carrying an alarm-

clock. Then a curious thing happens: with a sweep of her trunk, the elephant Topsy lifts Jocko, the monkey, out of his red box.

"You must unlock the cages," says Topsy.

"All right," says Jocko. And he does.

Then all the lions, tigers, leopards, boar-hounds, Tibet goats, bears, ponies, and wild boars join in the procession, while the alarm-clocks beat time. Black Prince walks first, and, presently wheeling the line toward me, lifts his fore paw and says:

"Mein Herr, it is six o'clock."

THE DYNAMITE WORKER

I

THE STORY OF SOME MILLIONAIRE HEROES AND
THE WORLD'S GREATEST POWDER EXPLOSION

HERE is illustrated in this career of the explosive maker a splendid fact touching courage, that, once a man has begun to practise it, the habit holds him with stronger and stronger grip, so that he *must* be brave whether he will or no. I think a fireman, for instance, who for years had jumped at the tap of a bell into any peril, would show the same fine courage all alone, let us say, in some crisis on a desert island. He could n't turn coward if he tried.

It is good to know, too, that these fearless qualities may be transmitted from father to son, so that we have whole families born, as it were, to be brave, and we see the son of a pilot facing the seasick torture for twenty-odd years, as his father faced it before him for thirty. Nor is it possible to be in close relations with a very brave man without yielding in some measure to his personality; heroes produce heroes through a sort of neighborhood influence, just as surely as thieves produce their kind. Thus the brother-in-law of a lion-tamer, though previously a mild enough man, takes to taming lions, and does it well. And wives of acrobats find themselves one day quietly facing perils of the air that would surely have blanched their cheeks had they married, let us say, photographers.

All of which brings me to a remarkable family of explosive makers—the Duponts of Wilmington, who for generations now have had practical monopoly in this country of the powder-making business, including dynamite and nitroglycerin. In this enterprise a great fortune has accumulated, so that the Duponts of to-day are very rich men, far beyond any need of working in the mills themselves, and have been for years. Yet, work in the mills they do, all of them, practically, and direct in detail every process of manufacture, and face continually in their own persons the same terrible dangers that the humblest mixer faces. There has grown in their hearts through the century, along with riches, a great pride of courage, like that of the officer who leads his men into battle—a pride far stronger than any longing for idleness or pleasure. And they *cannot*, if they would, leave these slow-grinding mills, where any day a spark may bring catastrophe to make the whole land shudder, as it has shuddered many times after the fury of these giant magazines.

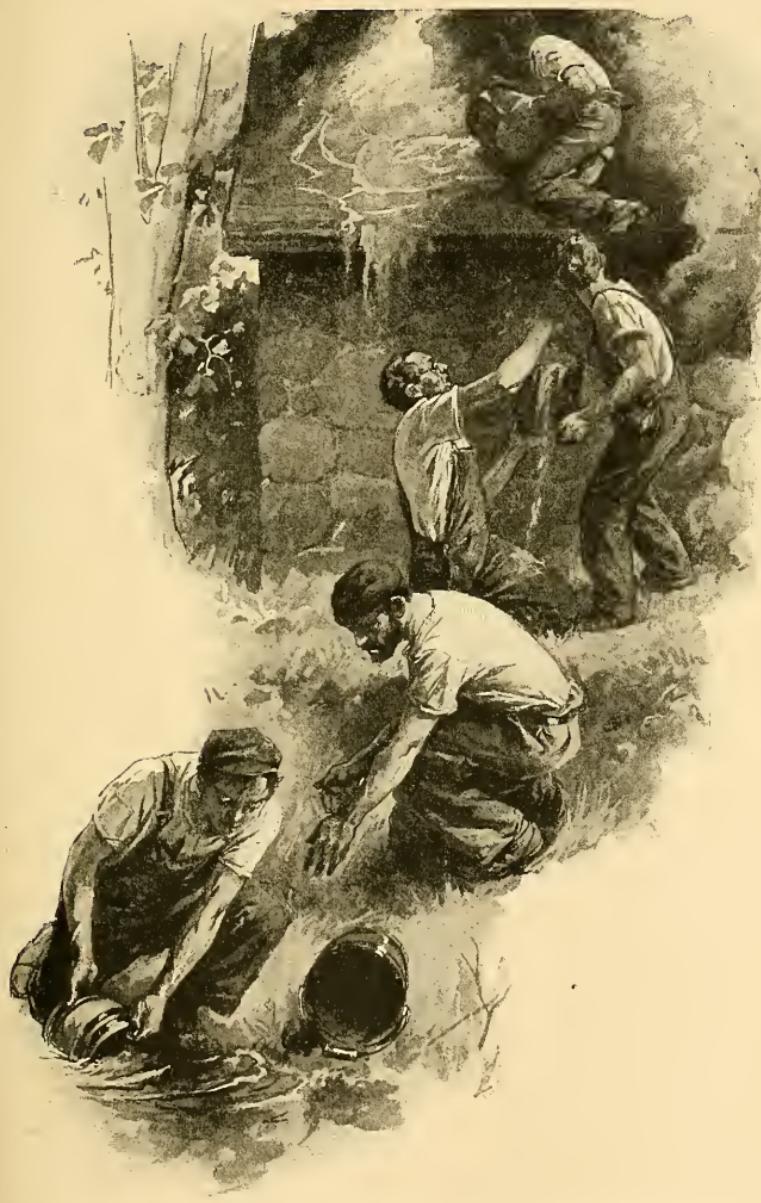
There came a day, for instance—this was a long time ago—when a swift flame swept through one of the mixing-rooms, nearly empty of powder at the time, yet so permeated with the stuff in floor and walls that instantly the building was burning fiercely. No man can say what started it. The cause of trouble at a powder-mill is seldom known; it comes too quickly, and usually leaves no witness. A nail overlooked in a workman's heel may have done the harm by striking a stone, though of course there is an imperative rule that all footgear made with nails be left outside the walls; or a heavy box slid along the wooden floor may have brought a flash out of the dry timbers. At any rate, the flash came, and the blaze followed on it so swiftly that the building was wrapped in fire before men

inside could reach the door, and they presently burst out blazing themselves, for their clothing, as it must be, was sifted through with explosive dust. Indeed, it is always true in fires at powder-mills that the workmen themselves are a serious menace to the buildings by reason of their own inflammability.

So the next thing was a plunge into the placid Brandywine, which winds across the yards between willow-hung banks. In went the men, in went young Alexis Dupont, and with a little hiss their flaming garments were extinguished. Then, as they struck out into the stream, they looked back and saw that the wind was carrying a shower of sparks from the burning building to the roof of a cutting-mill near by, where tons of powder lay. For one of the sparks to reach the tiniest powder train would mean the blowing up of this mill, and almost certainly the blowing up of another and another by the concussion, for it is in vain that they try to protect powder-mills by scattering them over wide yards in many little buildings. When one explodes, the great shock usually sets off others, as a falling rock turns loose an avalanche.

All this young Dupont realized in a single glance. There would be an awful disaster presently, with many lives imperiled, unless those falling firebrands could somehow be kept off that roof. To know this was to act. Millionaire or not, peril or not, it was his plain duty as a Dupont to fight those sparks, and, without a moment's wavering, he turned back and scrambled up the bank.

“Come on, boys!” he cried; “start the bucket line,” and a moment later he was climbing to the roof of the threatened mill, where he did all that a brave man can do—stamped out the falling embers, dashed water again and again upon the kindling fire as the



YOUNG DUPONT WORKING TO SAVE THE POWDER-MILL.

men passed up full buckets, and for a time seemed to conquer. But presently the fire flamed hotter, the sparks came faster, and the water came not fast enough. He saw—he must have seen—that the struggle was hopeless, that the mill beneath him was doomed, that the explosion must come soon. From the ground they shouted, calling on him to save himself. He shouted back an order that they pass up more water, and keep passing water. There was only one thing in the world he wanted—water.

The men below did their best, but it was a vain effort, for in those days the roofs of powder-mills were made of pitch and cement—not of iron, as to-day—and by this time the fire had eaten its way nearly through. Alexis Dupont, working desperately, stood there with flames spreading all around him. It was plain to every one that the minutes of his life were numbered. Again they shouted—and—

The explosion came like an execution, and out of the wreck of it they bore away his crushed and broken body. The last thing he knew was that he had played the game out fairly to the end—he died like a Dupont, said the men.

Such was the spirit of the second generation (Alexis Dupont was a son of old Eleuthere, founder of the line), and later we find the same courage in the third generation, as on March 29, 1884, when La Motte Dupont, one of the grandchildren, took his stand inside the dynamite-mill—his mill—when it was threatened by fire, and stayed there after every man had left it, struggling with hand and brain against the danger until the explosion, coming like a thousand cannon, crashed his body deep into a sand-heap and left it with the life gone out.

I suppose this is only an instance of nature's ten-

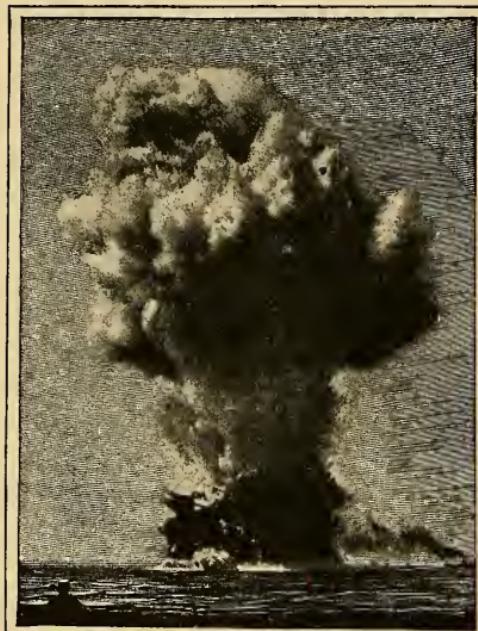
dency to furnish always what is needed, to raise up a hero for each emergency; but it is encouraging to know that the very finest kind of courage may be thus developed by the mere pressure of moral responsibility in a man under no master, but free to be a craven if he will. We have seen something like this in the splendid devotion of fire-department chiefs, who often outshine all their men simply because they cannot resist the gallant spirit in their own hearts.

Now for the exception to this rule of persisting courage, an exception sometimes presented in the lives of explosive makers (and in the other lives, too), and showing that in certain cases courage may suddenly and strangely disappear. A man may be brave for years, and then cease to be brave. The wild-beast tamer may awaken some morning and discover himself afraid of his lions. The steeple-climber who has never flinched at any height may shrink at last. The pilot in the rapids, the acrobat on his swing, the diver sinking to a wreck, may feel a quaking of heart unknown before. Here is apparent contradiction, for how can courage be made by habit and then unmade? I don't know. I merely give the facts as I have found them, and it is quite certain that a sturdy Irishman who has shoveled powder all his life and waded in it knee-deep, as if it were so much coal-dust, may, for no reason he can put finger on, find himself lying awake of nights reflecting on what would happen if a spark should strike under one of the big rollers he feeds so carelessly, or, remembering uneasily that dream of his wife's about a white horse—every powder-man knows the close relation between dreams and explosions, and—well, they will all tell you this, that the only thing for a man to do when his heart feels the cold touch of fear is to quit his job. If he does n't his knell is sounded, he

is marked for sacrifice, his tigers will rend him, the deep waters will overwhelm him, a swift fall will crush him—he will surely die.

The greatest catastrophe in the records of powder-making came because a man ignored such plain warning of his own fear. At least, the workmen at the

Dupont mills will tell you this if you can get them to break through their usual reserve. The man was William Green, and, whatever his fault, he paid the fullest price for it. Green was stationed in one of the magazines, with the responsibility of sealing up hexagonal powder, a very powerful kind used by the government in heavy guns. This powder comes



EFFECTS OF DYNAMITE EXPLODED UNDER WATER.

pressed into little six-sided cakes of reddish color, which are packed in large wooden boxes lined with tin, and it was Green's duty to solder the tin covers tight with a hot iron. In each box there was enough of this powder to blow up a fortress, and it is no wonder the occupation finally told on Green's nerves. He said to his wife that sooner or later a speck of grit would touch his iron and make a spark, and then— The theory is that a spark is required to explode powder which will

only burn harmlessly at the touch of a hot iron or a flame.

However this may be (and I should add that the theory is disputed), Green felt that he was in danger, and by that fact, say the powder-men, if for no other reason, he *was* in danger. And one day—it was October 7, 1890—the spark came; surely that was a most important spark, for it caused the explosion of one hundred and fifty tons of gunpowder, the instant death of thirteen men and one woman, and the serious or fatal injury of twenty-two men and nine women.

Only an earthquake could have wrought such terrible destruction. The city of Wilmington was shaken to its foundations. Great chasms were rent in the solid rock under the exploding magazines. Trees were torn up by the roots. Iron castings, weighing tons, were hurled clean across the Brandywine. Iron columns thick as a man's waist were twisted and bent like copper wire. Horses outside the yards were found with legs missing; men were found stripped clean of their clothes, and this curious fact was developed, that a man or a horse in the region of explosion would have shoes blown from the feet (iron shoes or leather shoes) if the legs were on the ground at the moment of shock, but would keep shoes on if the legs were lifted. Thus poor Green was found with both feet shod, and so identified, although his body had no other stitch of covering, and the explanation was that he probably saw the spark in time to spring away, and was actually in the air when the explosion came.

In my investigations I have heard various stories showing what uncertainty there is as to the behavior of dynamite in the presence of fire. Workmen who handle it constantly in blasting operations say you can put fire to a stick of dynamite without danger,

and it will simply burn away in bluish flame. On the other hand, they admit that in every fifty or a hundred sticks there may be one where the touch of fire *will* bring explosion.

It is quite certain this was the case in New York's



THE EXPLOSION IN THE NEW YORK CITY TUNNEL.

recent tunnel accident near One Hundred and Eightieth Street, and I have some facts of interest here obtained from a workman who was in the main gallery at the time. This man heard a shout of warning, and, looking down the rock street, saw a puddle of blazing oil from one of the lamps lapping at the side of a heavy wooden box. He knew that the box was full of dynamite, and as he looked he saw the yellow oil flame turn

to blue. That was enough for him, and he started to run for his life. But the explosion caught him in the first step, lifted him from the ground, and bore him on, while his legs kept up the motions of running. He was running on the air.

As he was thus hurled along his knee struck a large stone between the siding and the north heading, and he fell on his face, half dazed. The air was thick with strangling fumes, there was a frightful din about him—yells and crashing stones. Every lamp had been blown out, and in the utter darkness he could see the glaring eyeballs of fleeing negroes, who cursed in awful oaths as they ran. He pressed his mouth close to the ground, and found he could breathe better. He felt some one step over him, and seized a leg. The leg kicked itself free and went on. He groped about with his hands, and touched an iron rail; it was the little track for hauling the dumping-cars. He crept along this painfully to the siding, then down the siding to the shaft, where, in the blackness, he found a frantic company—negroes mad with fright, Italians screaming and praying, Irishmen keeping fairly cool, but wondering why, oh, why! the elevator did not come, and several men stretched on the ground quite still or groaning quietly.

Time lacks for the rest of the story; they took out men dressed in a collar and shirt-band only—everything else blown off, and some whose faces were mottled with fragments of stone, a kind of dynamite tattooing, and some grievously injured. There are no limits to the fury of dynamite, once it sets out to be cruel.

II

WE VISIT A DYNAMITE-FACTORY AND MEET A MAN WHO THINKS COURAGE IS AN ACCIDENT

ON a certain pleasant morning in June, I set forth to visit a dynamite-factory, and see with my own eyes, if might be, some of the men who follow this strange and hazardous business. As the train rushed along I thought of the power for good and evil that is in this wonderful agent: dynamite piercing mountains; dynamite threatening armies and blowing up great ships; a teacupful of dynamite shattering a fortress, a teaspoonful of the essence of dynamite—that is, nitroglycerin—tearing a man to atoms. What kind of fellows must they be who spend their lives making dynamite!

In due course I found myself back in the hill land of northern New Jersey, where everything is green and quiet, a lovely summer's retreat with nothing in external signs to suggest an industry of violence. Stop; here is a sign, though it does n't seem much: two sleepy wagons lumbering along the road between these cool woods and the waving fields. Farm produce? Lumber? No. The first is loaded with a sort of yellow meal, and trails the way with yellow sprinklings. That is sulphur. They use it at the works. The second is piled up with crates, out of which come thick glass necks like the heads of imprisoned turkeys. These are carboys of nitric acid, hundreds of gallons of that

terrible stuff which is so truly liquid fire that a single drop of it on a piece of board will set the wood in flames. This nitric acid mixed with innocent sweet glycerin (*it* comes along the road in barrels) makes nitroglycerin, and the proper mixing of these two is the chief business of a dynamite-factory.

Farther down the road I came to a railroad track where a long freight-train was standing on a siding. Some men were busy here loading a car with clean-looking wooden boxes that might have held starch or soap, but *did* hold dynamite neatly packed in long, fat sticks like huge fire-crackers. Each box bore this inscription in red letters: HIGH EXPLOSIVES. DANGEROUS. I looked along the train and saw that there were several cars closed and sealed, with a sign nailed on the outside: POWDER. HANDLE CAREFULLY.

In this case "powder" means dynamite, for the product of a dynamite-factory is always called powder. I think the men feel more comfortable when they use that milder name. There was "powder" enough on this train to wreck a city, but nobody seemed to mind. The horses switched their tails. The men laughed and loitered. They might have been laying bricks, for any interest they showed.

I asked one of them if it is considered safe to haul car-loads of dynamite about the country. He said that some people consider it safe, and some do not; some railroads will carry dynamite, while others refuse it.

"Suppose a man were to shoot a rifle-ball into one of these cars," I asked, "do you think it would explode?"

This led to an argument. One of the group was positive it *would* explode. Concussion, he declared, is the thing that sets off dynamite. Another knew of experiments at the works where they had fired rifle-

balls into quantities of dynamite, and found that sometimes it exploded and sometimes it did n't.

Then a third man spoke up with an air of authority. "You 've got to have a red spark," said he, "to set off dynamite. I 've handled it long enough to know. Here 's an experiment that 's been tried: They took an old flat-car and loaded it with rocks; then they fastened a box of dynamite to the bumper, and let the car run down a steep grade, bang! into another car anchored at the bottom. And they found that the dynamite never exploded unless the bumpers were faced with iron. It did n't matter how much concussion they got with wooden bumpers, the dynamite was like that much putty; but as soon as a red spark jumped into it out of the iron, why, off she 'd go."

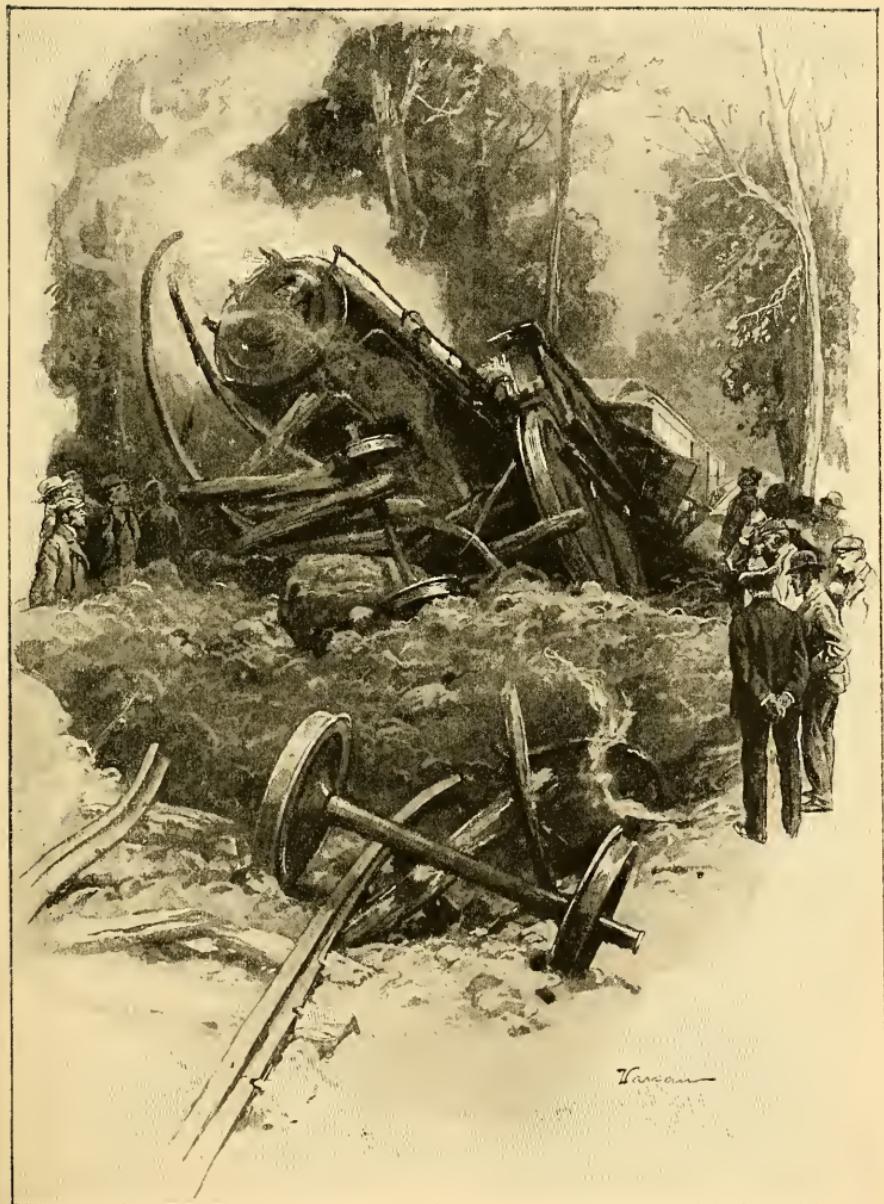
Then he instanced various cases where powder-cars had gone through railroad wrecks without exploding, although boxes of dynamite had been smashed open and scattered about.

"How about that car of ours the other day up in central New York?" said the first man. "Everything blown to pieces, and six lads killed."

He smiled grimly, but the other persisted: "That collision only proves what I say. There was a red-hot locomotive plowing through a car of dynamite, and of course she went up. But it was n't the concussion did it; it was the sparks."

"You say that it takes a red spark," I observed, "to set off dynamite. Do you mean that a white spark would n't do it?"

"That 's what I mean," said he. "It seems queer, but it 's a fact. Put a white-hot poker into a box of dynamite, and it will only burn; but let the poker cool down until it 's only red-hot and the dynamite will explode."



"EVERYTHING WAS BLOWN TO PIECES."

Pondering this remarkable statement, I continued on my way, and presently, not seeing any big building, asked a farmer where the Atlantic Dynamite Works were. He swept the horizon with his arm, and said they were all about us; they covered hundreds of acres —little, low buildings placed far apart, so that if one exploded it would n't set off the rest.

“The dynamite-magazines are along the hillside yonder,” he said. “If they went up, I guess there would n't be much left of the town.”

“What town?” said I.

“Why, Kenvil. That 's where the dynamite-mixers live. It 's over there. Quickest way is across this field and over the fence.”

I followed his advice, and presently passed near a number of small brick buildings so very innocent-looking that I found myself saying, “What! *this* blow up, or *that* little sputtering shanty wreck a town?” It seemed ridiculous. I learned afterward that I had walked through the most dangerous part of the works; it is n't size here that counts.

I paused at several open doors, and got a whiff of chemicals that made me understand the dynamite-sickness of which I had heard. No man can breathe the strangling fumes of nitric acid and nitrated glycerin without discomfort, and every man here *must* breathe them. They rise from vats and troughs like brownish-yellow smoke; they are in the mixing-rooms, in the packing-rooms, in the freezing-house, in the separating-house, everywhere; and they take men in the throat, and make their hearts pound strangely, and set their heads splitting with pain. Not a workman escapes the dynamite-headache; new hands are wretched with it for a fortnight, and even the well-seasoned men get a touch of it on Monday mornings after the Sunday rest.

In walking about the works I noticed that the several buildings, representing different steps in the manufacture of explosives, are united by long troughs or pipes sufficiently inclined to allow the nitroglycerin to flow by its own weight from one building to another, so that you watch the first operations in dynamite-making at the top of a slope, and the last ones at the bottom. Of course this transportation by flow is possible for nitroglycerin only while it is a liquid, and not after it has been absorbed by porous earth and given the name of dynamite and the look of moist sawdust. As dynamite it is transported between buildings on little railroads, with horses to haul the cars.

I noted also that most of the buildings are built against a hillside or surrounded by heavy mounds of earth, so that if one of them blows up, the others may be protected against the flight of debris. Without such barricade the shattered walls and rocks would be hurled in all directions with the energy of cannon-balls, and a single explosion would probably mean the destruction of the entire works.

At one place I saw a triangular frame of timbers and iron supporting a five-hundred-pound swinging mortar, that hung down like a great gipsy kettle under its tripod. In front of this mortar was a sand-heap, and here, I learned, were made the tests of dynamite, a certain quantity of this lot or that being exploded against the sand-heap, and the mortar's swing back from the recoil giving a measure of its force. The more nitroglycerin there is in a given lot of dynamite, the farther back the mortar will swing. It should be understood that there are many different grades of dynamite, the strength of these depending upon how much nitroglycerin has been absorbed by a certain kind of porous earth.

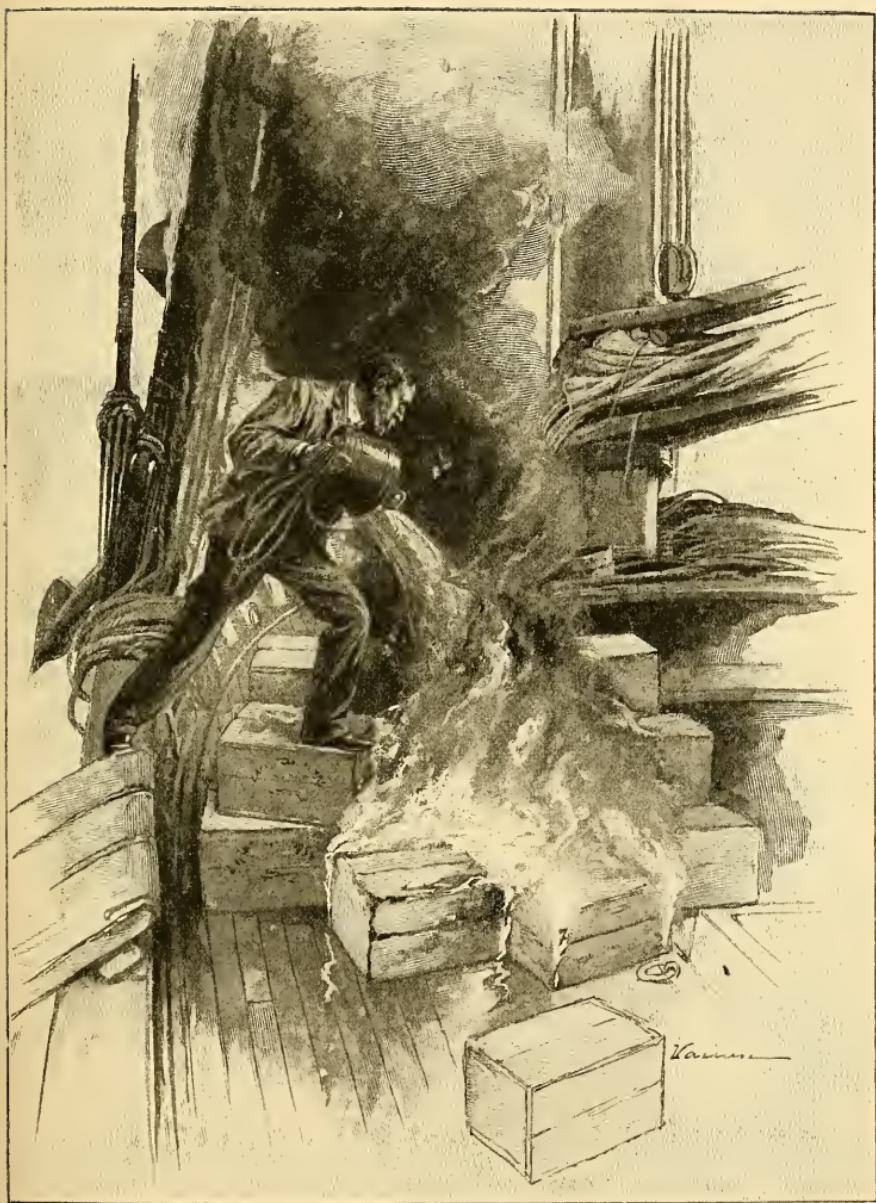
In a little white house beyond the laboratory I found the superintendent of the works, a man of few words, accustomed to give brief orders and have them obeyed. He did not care to talk about dynamite—they never do. He did not think there was much to say, anyhow, except that people have silly notions about the danger. He had been working with dynamite now for twenty-five years, and never had an accident—that is, himself. Oh, yes; some men had been killed in his time, but not so many as in other occupations—not nearly so many as in railroading. Of course there was danger in dealing with any great force; the thing would run away with you now and then: but on the whole he regarded dynamite as a very well behaved commodity, and much slandered.

“Then you think dynamite-workers have no great need of courage?” I suggested.

“No more than others. Why should they? They work along for years, and nothing happens. They might as well be shoveling coal. And if anything does happen, it’s over so quick that courage is n’t much use.”

Having said this, he hesitated a moment, and then, as if in a spirit of fairness, told of a certain man at the head of a nitroglycerin-mill who on one occasion *did* do a little thing that some people called brave. He would n’t give the name of this “certain man,” but I fancied I could guess it.

This nitroglycerin-mill, it seems, was on the Pacific coast, whence they used to ship the dynamite on vessels that loaded right alongside the yards. One day a mixing-house exploded, and hurled burning timbers over a vessel lying near that had just received a fresh cargo. Her decks were piled with boxes of explosives—wooden boxes, which at once took fire. When this



"HE WENT TO WORK THROWING WATER ON THE BURNING BOXES."

“certain man” rushed down to the dock, the situation was as bad as could be. There were tons of dynamite ready to explode, and a hot fire was eating deeper into the wood with every second. And all the workmen had run for their lives!

“Well,” said the superintendent, “what this man did was to grab a bucket and line, and jump on the deck. Yes, it was burning; everything was burning. But he went to work lowering the bucket overside and throwing water on the flaming boxes. After a while he put ‘em out, and the dynamite did n’t explode at all; but it would have exploded in a mighty short time if he had kept away, for the wood was about burned through in several places. I know that’s a true story, because, well—because I *know* it.”

“Don’t you call that man brave?” I asked.

The superintendent shook his head. “He was brave in that particular instance, but he might not have been brave at another time. You never can tell what a man will do in danger. It depends on how he feels or on how a thing happens to strike him. A man might act like a hero one day and like a coward another day, with exactly the same danger in both cases. There’s a lot of chance in it. If that man I’m telling you about had been up late the night before, or had eaten a tough piece of steak for breakfast, the chances are he would have run like the rest.”

III

HOW JOSHUA PLUMSTEAD STUCK TO HIS NITRO-GLYCERIN-VAT IN AN EXPLOSION AND SAVED THE WORKS

I DROVE over from the works to Kenvil under the escort of a red-nosed man who discoursed on local matters, particularly on the prospects of his youngest son, who was eighteen years old and earned three dollars a day.

“What does he do?” I asked.

“He’s a packer,” said the red-nosed man.

“What does he pack?”

“Dynamite. Guess there ain’t no other stuff he c’d pack an’ get them wages. Jest the same, I wish he’d quit, specially sence the big blow-up t’ other day.”

“Why, what blew up?” I inquired.

“Freezing-house did with an all-fired big lot of nitro-glycerin. Nobody knows what set her off. Reg’lar miracle there wa’n’t a lot killed. Man in charge, feller named Ball, he went out to look at a water-pipe. Had n’t been out the door a minute when off she went. Say, you’d oughter seen the boys run! They tell me some of ‘em jumped clean through the winders, sashes an’ all. If ye want to know more about it, there’s my boy now; he was right near the house when it happened.”

We drew up at the Kenvil hotel, where a young man was sitting. Here was the modern dynamite-worker, and not at all as I had pictured him. He

looked like a summer boarder who liked to take things easy and wear good clothes. Wondering much, I sat down and talked to this young man, a skilful dynamite-packer, it appears, who happened at the time to be taking a day off.

"They put me at machine-packing a few days ago," he said, "and it 's made my wrist lame. Going to rest until Monday."

After some preliminaries I asked him about the process of packing dynamite, and he explained how the freshly mixed explosive is delivered at the various packing-houses in little tubs, a hundred pounds to a tub, and how they dig into it with shovels, and mold it into shape on the benches like so much butter, and ram it into funnels, and finally, with the busy tamping of rubber-shod sticks, squeeze it down into the paper shells that form the cartridges. One would say they play with concentrated death as children play with saw-dust dolls, but he declared it safe enough.

"How large are the cartridges?" I asked.

"Oh, different sizes. The smallest are about eight inches long, and the largest thirty. And they vary from one inch thick up to two and a half. I know a man who carried a thirty-inch cartridge all the way to Morristown in an ordinary passenger-car. He had it wrapped in a newspaper, under his arm like a big loaf of bread. But say, he took chances, all right."

At this another man informed us that people often carry nitroglycerin about with them, and take no risk, by simply pouring it into a big bottle of alcohol. Then it can do no harm; and when they want to use the explosive, they have only to evaporate the alcohol.

The talk turned to precautions taken against accidents. In all powder-mills the workmen are required to change their clothes before entering the buildings,

and to put on rubber-soled shoes. There must be no bit of metal about a man's person, no iron nail or buckle, nothing that could strike fire; and of course the workman who would bring a match on the premises would be counted worse than an assassin.

"Just the same, though, matches get into the works once in a while," remarked the young packer. "I found a piece of a match one day in a tub of dynamite; it had the head on, too. Say, it 's bad enough to find buttons and pebbles, but when I saw that match-head—well, it made me weak in the knees."

This brought back the old question, When does dynamite explode, and when does it not explode? I mentioned the red-spark theory.

"I think that 's correct," agreed the packer. "I 've watched 'em burn old dynamite-boxes, and if there are iron nails in the boxes they explode as soon as the nails get red-hot; if there are no nails, they don't explode."

"You mean empty boxes?" I asked.

"Certainly; but there 's nitroglycerin in the wood, lots of it. It oozes out of the dynamite, especially on a hot day, and soaks into everything. Why, I suppose there 's enough nitroglycerin in the overalls I wear to blow a man into—well, I would n't want to lay 'em on an anvil and give 'em a whack with a sledge."

There was a certain novelty to me in the thought of a pair of old overalls exploding; but I was soon to hear of stranger things. By this time other workmen had drawn up chairs, and were ready now with modest contributions from their own experience.

"Tell ye a queer thing," said one man. "In that explosion the other day,—I mean the freezing-house,—a car loaded with powder [dynamite] had just passed, not a minute before the explosion. Lucky for the three men with the car, was n't it? But what gets me is

how the blast, when it came, blew the harness off the horse. Yes, sir; that 's what it did—clean off; and away he went galloping after the men as hard as he could leg it. Nobody touched a buckle or a strap. It was dynamite unhitched that animal."

"Dynamite did another trick that day," put in a tall man. "It caught a bird on the wing. Dunno whether 't was a robin or a swaller, but 't was a bird, all right. Caught it in a sheet of tin blowed off the roof, an' jest twisted that little bird all up as it sailed along, and when it struck the ground, there was the bird fast in a cage made in the air out of a tin roof. Alive? Yes, sir, alive; and that shows how fast dynamite does business."

So the talk ran on, with many little details of explosions. The expert explained that the air waves of a great concussion move along with crests and troughs like water waves, and the shattering effect comes only at the crests, so that all the windows might be broken in a house, say, half a mile from an explosion, and no windows be broken in a house two hundred yards nearer. The first house would have been smitten by a destructive wave crest, the second passed over by a harmless wave trough. And, by the way, when windows are broken by these blasts of concussion, it appears that they are usually broken *outward*, not inward, and that the fragments are found on the ground outside the house, not on the floors inside. The reason of this is that the concussion waves leave behind them a partial vacuum, and windows are broken by the air *inside* houses rushing out.

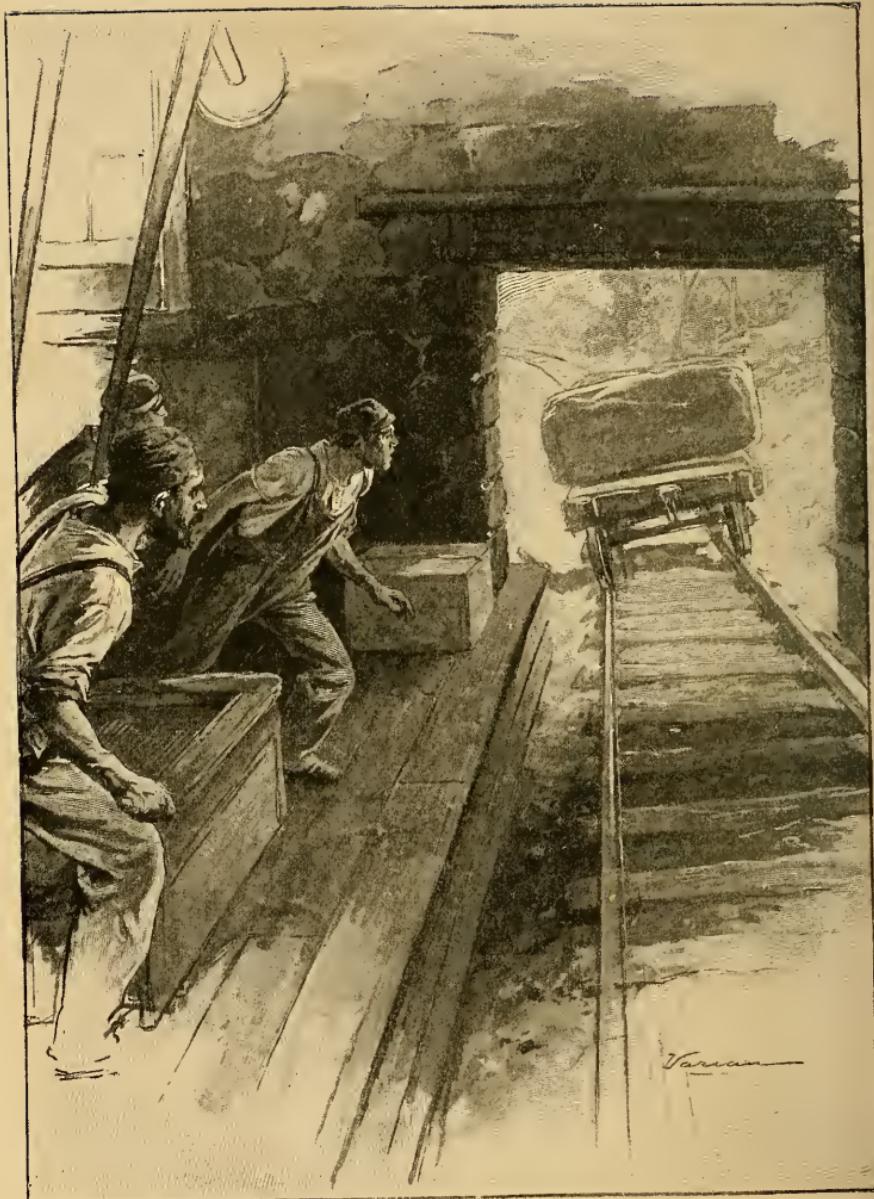
"How about thunder-storms?" I asked.

"There is always danger," said the expert, "and all hands hurry out of the works as soon as the lightning begins to play. If a bolt struck a lot of dynamite it would set it off."

Then he explained that the policy of dynamite manufacturers is to handle explosives in small quantities, say a ton at a time, each lot being finished and hauled away in wagons before another lot is started. This is possible because of the short time occupied in making dynamite. He assured me, for instance, that if there were only raw materials at the works on a certain morning when the seven-o'clock whistle blew, it would be perfectly possible to have a ton of dynamite-cartridges finished, packed in boxes, and loaded on freight-cars by nine o'clock.

After this some one told of a thrilling happening in the mixing-house, by the great vat, wherein nitro-glycerin is mixed with porous earth, called dope, and becomes dynamite. Over this vat four men work continually, two with rakes, two with hoes, kneading half a ton or more of explosive dough to the proper consistency.

One day a powder-car loaded with heavy stone got loose on its track a quarter of a mile up the slope, and started down the steep grade. The tracks ran straight into the mixing-house. The switch was open, and the first thing these men knew, there was an angry clang at the switch, and then a swift, heavy car was plunging toward the open door, with every chance that it would set off twelve hundred pounds of dynamite there. Workmen outside shouted, and then stared in horror. Not a man in the mixing-house moved. All four kept their places around the vat, held tight to their rakes and hoes, while the car, just missing the dynamite, hurled its mass of two tons through the back wall of the building, and spent its force against a tree-trunk. There was no explosion, and nothing happened, which was something of a miracle; but what impressed me was that these four men stood still, not from courage, but because they were frozen with fear!



"A SWIFT, HEAVY CAR WAS PLUNGING TOWARD THE OPEN DOOR."

While there is danger in every step of dynamite manufacture, it appears that the center of peril is in the nitrating-house, where the fresh glycerin is mixed with nitric acid, or, more correctly, is nitrated by it. This operation takes place in a great covered vat about which are many pipes and stop-cocks. A man stands here like an engineer at the throttle, watching his thermometer and letting in fresh glycerin. These are his two duties, and upon the right performance of them depends the safety of the works. Every hour he must let in some seven hundred pounds of glycerin upon the deadly acid, and every hour he must draw off some fifteen hundred pounds of nitroglycerin and let it go splashing away in a yellowish stream down the long, uncovered trough that leads to the separating-house yonder. From this separating-house runs another trough to the freezing-house, and a third to the distant mixing-house. These three troughs inclose an oblong space, at the corners of which stand the nitrating-house, the separating-house, and the freezing-house. In each one of these, at any hour of the day, is a wagon-load of pure nitroglycerin, while in the three troughs are little rivers of nitroglycerin always flowing.

The arrangement of buildings in this part of the works makes clearer what was done at the nitrating-house by a certain Joshua Plumstead in the recent explosion. Joshua is a veteran at dynamite-making. He has worked at the nitrating-vat for twenty-five years, and has probably made more nitroglycerin than any one man in the world. He has been through all the great explosions; he has seen many men killed; he has stood by time and again when his own nitrating-vat has taken fire; and yet he always comes through safely. They say there is no man like Joshua for nerve and

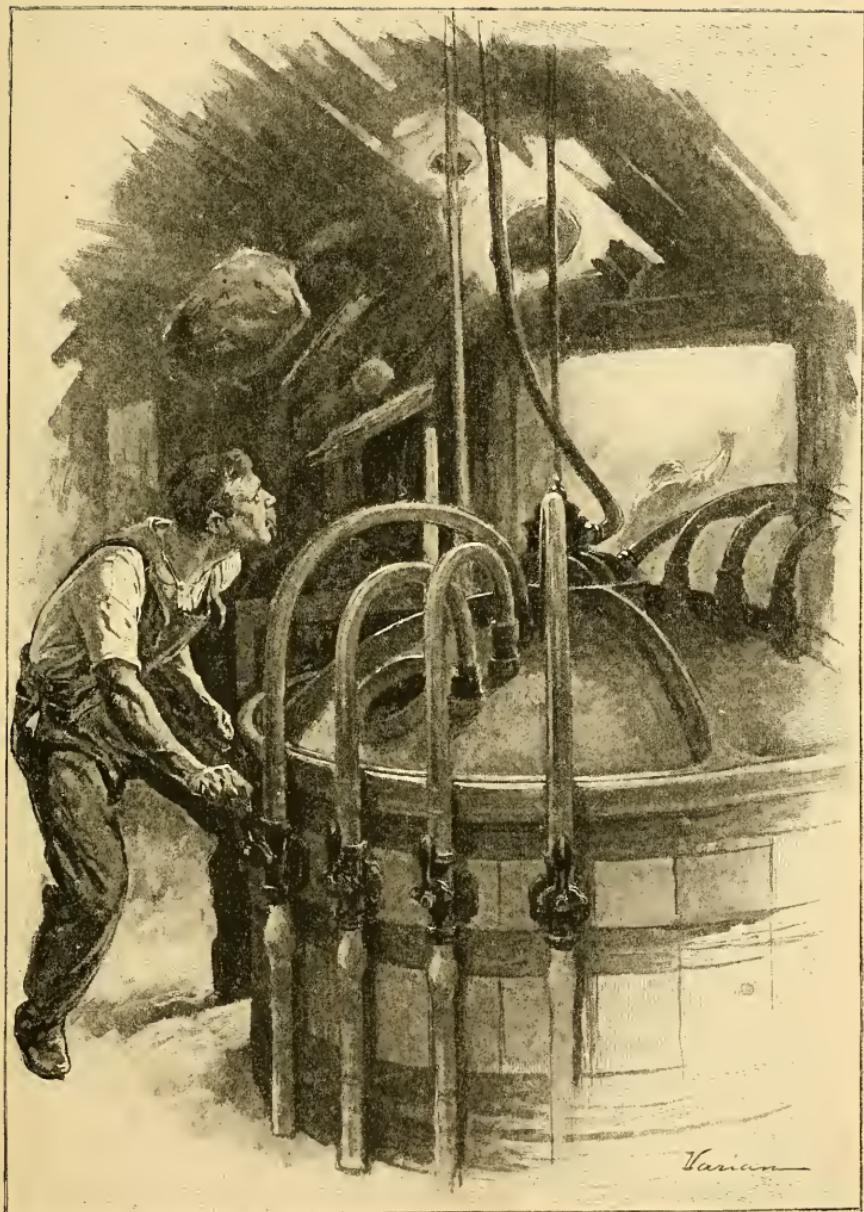
judgment when the demons of gas and fire begin to play.

This explosion took place at the freezing-house, which is the one place in all the works where dynamite is never expected to explode. Yet it *did* explode now, with a smashing of air and a horrible grinding under-foot that stifled all things in men but a mad desire to flee.

Joshua Plumstead was in the nitrating-house alone. His helper had fled. The roof timbers were crashing down about him. He heard the hiss of fire and the shouts of workmen running. He knew that a second explosion might come at any moment. There was danger from fire-brands and flying masses of stone and iron, danger from the open troughs, danger from the near-by houses. A shock, a spark anywhere here might mean the end.

Plumstead kept his eyes on the long thermometer that reached up from the furious smoking mass of oil and acid. The mercury had crept up from eighty-five to ninety, and was rising still. At ninety-five he knew the nitroglycerin would take fire, probably explode, and nothing could save it. The vat was seething with a full charge. Ninety-one! He shut off the inflow of glycerin. Ninety-two! Something might be wrong with the coils of ice-cold water that chill the vat down to safety. He opened the cocks full. Crash! came a beam from overhead, and narrowly missed the gearing of the agitating-blades. Were they to stop but for a single second, the nitroglycerin would explode. He eased the bearings, turned on compressed air, watched the thermometer—and waited.

There was no other man but Plumstead who *did* wait that day; there was none but he whose waiting could avail anything. *He* had to fight it out alone



"HE KNEW THAT A SECOND EXPLOSION MIGHT COME AT ANY MOMENT."

with that ton of nitroglycerin, or run and let an explosion come far worse than the other. He fought it out; he waited, and he won. Gradually the thermometer dropped to eighty-five, to eighty, and the danger was passed.

But—well, even the superintendent admitted that Joshua did a rather fine thing here, while the workmen themselves and the people of Kenvil shake their heads solemnly and vow that he saved the works.

THE LOCOMOTIVE ENGINEER

I

HOW IT FEELS TO RIDE AT NIGHT ON A LOCOMOTIVE GOING NINETY MILES AN HOUR

IT is 8.30 P.M., any night you please, and for miles through the yards of East Chicago lights are swinging, semaphore arms are moving, men in clicking signal-towers are juggling with electric buttons and pneumatic levers, target lights on a hundred switches are changing from red to green, from green to red; everything is clear, everything is all right, the Lake Shore Mail is coming, with eighty tons of letters and papers in its pouches. Relays of engines and engineers have brought these messages, this news of the world, thus far on their journey. Up the Hudson they have come, and across the Empire State and along the shores of Lake Michigan, nearly a thousand miles in twenty-four hours, which is not so bad, although the hottest, maddest rush is yet to come.

It is a fine thing to know the men who drive the engines on these trains; just to see them is something, and to make them talk (if you can do it) is better business than interviewing most celebrities you have heard about.

To this end I set out, one evening early in January, for the great round-house of the Northwestern road, that lies on the outskirts of Chicago. A strange place, surely, is this to one who approaches it unprepared—

a place where yellow eyes glare out of deep shadows, where fire-dragons rush at you with crunchings and snortings, where the air hisses and roars. It might be some demon menagerie, there in the darkness.

To this place of fears and pitfalls I came an hour or so before starting-time, and here I found Dan White, one of the Northwestern crack-a-jacks, giving the last careful touches to locomotive 908 before the night's hard run. In almost our first words my heart was won by something White said. I had mentioned Frank Bullard of the Burlington road, a rival by all rights, and immediately this bluff, broad-shouldered man exclaimed: "Ah, he 's a fine fellow, Bullard is, and he knows how to run an engine." White would fight Bullard at the throttle to any finish, but would speak only good words of him.

"Tell me," said I, "about the great run you made the other night." From a dozen lips I had heard of White's tremendous dash from Chicago to Clinton, Iowa.

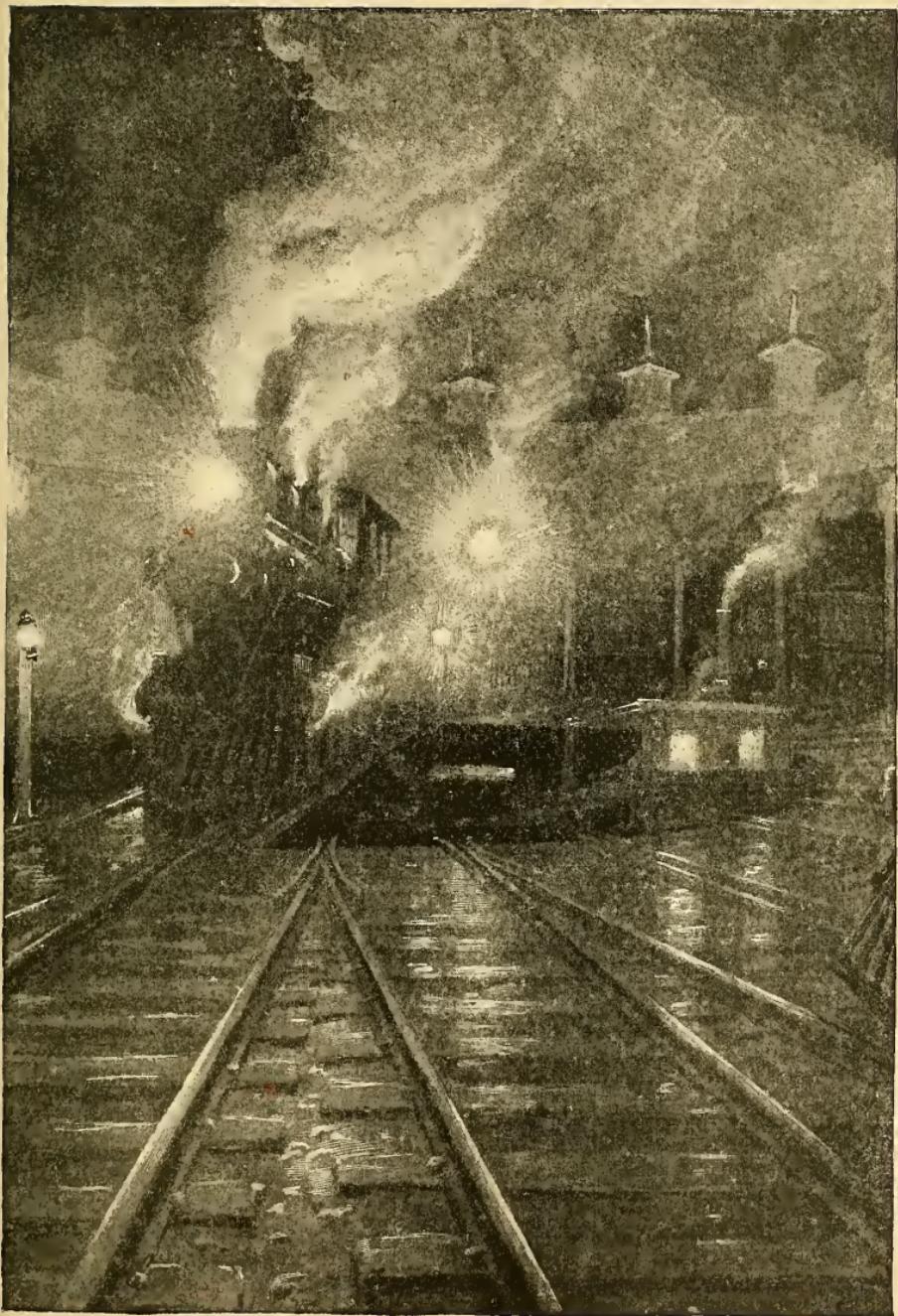
"Oh, it was n't much; we had to make the time up, and we did it. Did n't we, Fred?"

This to the fireman, who nodded in assent, but said nothing.

"You made a record, did n't you?"

"Well, we went one hundred and thirty-eight miles in one hundred and forty-three minutes; that included three stops and two slow-downs. I don't know as anybody has beat that—much."

By dint of questioning, I drew from this modest man some details of his achievement. The curve-bent stretch of seventeen miles between Franklin Grove and Nelson they did in fourteen minutes, and a part of this, beyond Nachusa, they took at an eighty-mile pace. They covered five miles between Clarence and Stan-



A PLACE WHERE YELLOW EYES GLARE OUT OF DEEP SHADOWS.

wood in three minutes and a half, and they made two miles beyond Dennison at over a hundred miles an hour. As the mail rushed west, word was flashed ahead, and crowds gathered at the stations to cheer and marvel.

"There must have been five hundred people on the platform at Dixon," said White, telling the story, "and they looked to me like a swarm of ants, just a black, wriggling mass, and then they were gone. We came on to a bridge there after a big reverse curve with a down grade, and I guess no one will ever know how fast we were going, as we slammed her around one way and then slammed her around the other way. It was every bit of ninety miles an hour. You got all you wanted, did n't you, Fred?"

The fireman looked up, torch in hand, and remarked, in a dry monotone: "Goin' through Dixon I said my prayers and hung on, stretched out flat. That 's what I done."

"Fred and I," continued White, "both got letters about the run from the superintendent. Here 's mine, if you 'd like to read it."

The pleasure of these two blackened men over this graciousness of the superintendent was a thing to see. For such a bit of paper, crumpled and smeared with oil, I believe they would have taken the Mississippi at a jump, engine, train, and all. Superintendent's orders, superintendent's praise—there is the beginning and end of all things for them.

My first long ride on one of these splendid locomotives was with the Burlington night mail (no passengers), 590 pulling her and Frank Bullard at the throttle. It is said that the Baldwin Locomotive Works never turned out a faster engine than this 590. The man must be a giant whose head will top her drivers,

and, for all her seventy tons, there is speed in every line of her. She is a young engine, too—only four years old—and Bullard swears he will back her in the matter of getting over rails to do anything that steel and steam can do. "She 's willing and gentle, sir, and easy running. You 'll see in a minute."

These words from Bullard, first-class engine-driver of the C. B. & Q., a long, loosely jointed man, with the eye and build of a scout. As he spoke they were coupling us to the mail-cars, in preparation for the start. In overalls and sweater I had come, with type-written authority to make the run that night. This was in the first week in January, the second time Bullard had drawn the throttle for Burlington on the new fast schedule. Burlington lay off there in Iowa, on the Mississippi, with all the night and all the State of Illinois between us.

Now the train stands ready—three mail-cars and the engine, not a stick besides. No Pullman comforts here, no bunks for sleeping, no man aboard who has the right to sleep. Everything is hustle and business. Already the mail clerks are swarming at the pouches, like printers on a rush edition. See those last bags swung in through the panel doors! Not even the president of the road may ride here without a permit from the government.

Bullard takes up a red, smoking torch and looks 590 over. He fills her cups, and prods a two-foot oiler into her rods and bearings. Dan Cleary, the fireman, looks out of his window on the left and chews complacently. Down the track beside him locomotive 1309 backs up, a first-class engine she, but 590 bulks over her as the king of a herd might over some good, ordinary working elephant. As she stands here now, purring through her black iron throat, 590 measures six-

teen feet three inches from rails to stack-top. Both engines blow out steam, that rolls up in silver clouds to the electric lights.

Bullard climbs to his place at the right, and a hiss of air tells that he is testing the brakes. Under each car sixteen iron shoes close against sixteen wheels, and stay there. Down the length of the train goes the repair man with his kit, and makes sure that every contact is right, then pulls a rope four times at the rear, whereupon four hissing signals answer in the cab. Bullard shuts off the air.

"It 's all there is to stop her with," says he, "so we take no chances with it. She 's got high-speed brakes on her, 590 has—one hundred and ten pounds to the inch. Twenty-four, Dan," he adds, and snaps his watch. "We start at thirty."

Dan chews on. "Bad wind to-night," he says; "reg'lar gale."

Bullard nods. "I know it; we 're fifteen minutes late, too."

"Make Burlington on time?"

"Got to; you hit it up, and I 'll skin her. Twenty-six, Dan."

Four minutes to wait. Two station officials come up with polite inquiries. The thermometer is falling, they say, and we shall have it bitter cold over the plains. They reach up with cordial hand-shakes. I pull my cap down, and take my stand behind Bullard. Our side of the cab is quite cut off from the fireman's side by a swelling girth of boiler, which leaves an alley-way at right and left wide enough for a man's body and no wider. Bullard and I are in the right-hand alley-way, Bullard's back and black cap just before me. Dan, with his shovel, is out on a shaky steel shelf behind, that bridges the space between engine and ten-

der. That is where he works, poor lad! We are breathing coal-dust and torch-smoke and warm oil.

“F-s-s-s-s-s-s!” comes the signal, and instantly we are moving. Lights flash about us everywhere—green lights, white lights, red lights, a phantasmagoria of drug-store bottles. The tracks shine yellow far ahead. A steady pounding and jarring begins, and grows like the roar of battle. Our cab heaves with the tugging of a captive balloon. Our speed increases amazingly. We seem constantly on the point of running straight through blocks of houses, and escape only by sudden and disconcerting swayings around curves that all lead, one will vow, straight into black chasms under the dazzle. Whoever rides here for the first time feels that he is ticketed for sure destruction, understands that this plunging engine *must* necessarily go off the rails in two or three minutes, say five at the latest; for what guidance, he reasons, can any man get from a million crazy lights, and who that is human can avoid a snarl in such a tangle of bumping switches? I am free to confess, for my own part, that I found the first half hour of my ride on 590 absolutely terrifying.

Thus, at break-neck speed, we come out of Chicago, all slow-going city ordinances to the contrary notwithstanding. We are chasing a transcontinental record schedule, and have fifteen minutes to make up. I breathe more freely as we get into open country. We are going like the wind, but the track is straighter, and the darkness comfortable. I begin to notice things with better understanding. As the lurches come, I brace myself against the boiler side without fear of burning; that is something learned. I find out later that I owe this protection to a two-inch layer of asbestos. I catch a faint sound of the engine bell, and discover,

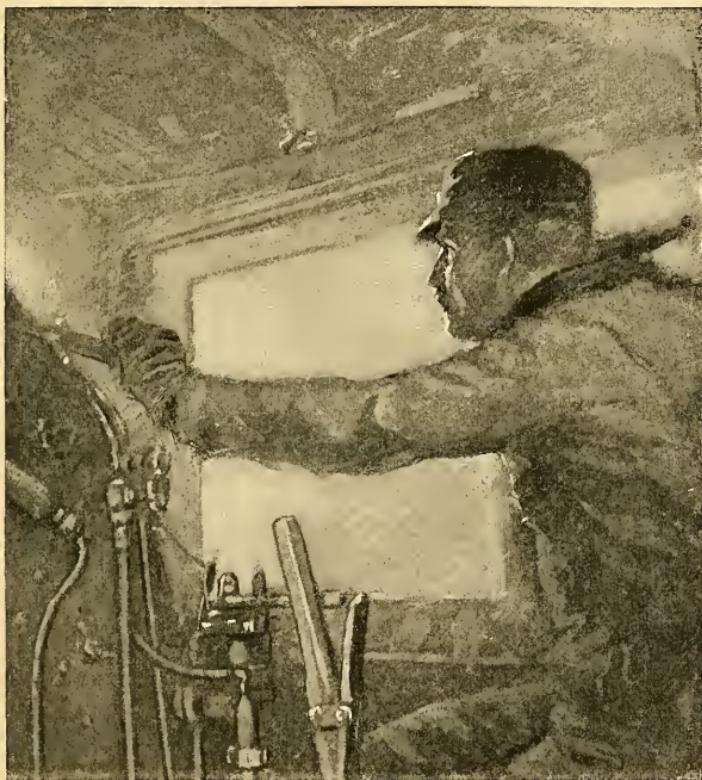
to my surprise, that it has been ringing from the start—indeed, it rings, without ceasing, all the way to Burlington, the rope pulled by a steam jerking contrivance, but the roar of the engine drowns it.

Deep shadows inwrap the cab, all the deeper for the glare that flashes through them every minute or two as Dan, back there on his iron shelf, stokes coal in at the red-hot door. Two faint lights burn for the gages—a jumping water column in front, a pair of wavering needles on the boiler. These Bullard watches coolly, and from time to time reaches back past me to turn the injector-cock, whereupon steam hisses by my head. For the most part he is quite still, like an Indian pilot, head forward at the lookout window, right hand down by the air-brake valve, left hand across the throttle lever, with only a second's jump to the reversing lever that rises up from the floor straight before him. As we race into towns and roar through them, he sounds the chime whistle, making its deep voice challenge the darkness. At curves he eases her with the brakes. And for grades and level stretches and bridges he notches the throttle up or down as the need is. Watch his big, strong grip on the polished handles! Think of the hours he spends here all alone, this man who holds life and death in his quick, sure judgment!

Now he catches the window-frame and slides it open. A blast sweeps in like an arctic hurricane. Bullard leans out into the night and seems to listen. "Try it," he cries, but his voice is faint. I put my head out, and come into a rush of air billows that strangle like breakers.

"Greggs—Hill—three—miles—long. Let—her—go—soon." He closes the window. And now, as we clear the grade, begins a burst of speed that makes the rest of small account. Faster and faster we go,

until the very iron seems alive and straining underneath us. I am tossed about in hard pitches. The glow of the furnace lights up continuously. There is no sense of fear any longer. It is too splendid, what



AT THE THROTTLE.

we are doing. Of course it means instant death if anything breaks. Let the massive side rod that holds the two drivers snap, and a half-ton knife sweeping seventy miles an hour will slice off our cab and us with it like a cut of cheese. Did not an engineer go to his death that way only last week on the Union Pacific run? After all, why not this death as well as any other?

Have we not valves and tubes in our bodies that may snap at any moment!

"How—fast?" I call out.

"Eighty—miles—an—hour," says Bullard, close to my ear, and a moment later pulls the rope for a grade crossing. "Ooooo—oooooo—oo—oo," answers the deep iron voice, two long and two short calls, as the code requires. "Year—ago—killed—two—men—here," he shouts as we whiz over the road. "Struck—buggy—threw—men—sixty—feet." I wonder how far we would throw them now.

In the two hundred and six miles' run to the Mississippi we stop only twice—for water, at Mendota and at Galesburg—nine minutes wasted for the two, and the gale blowing harder. Our schedule makes allowance for no stops; every moment from our actual going is so much "dead time" that must be fought for, second by second, and made up. Drive her as he will, with all the cunning of his hand, Bullard can score but small gains against the wind. And some of these he loses. At Mendota we have made up seven minutes, but we pull out thirteen minutes late. At Princeton we are fifteen minutes late, at Galva fourteen minutes, at Galesburg eight minutes, but we pull out twelve minutes late. Then we make the last forty-three miles, including bridges, towns, grades, and curves, in forty-four minutes, and draw into Burlington at 1.22 A.M.—on time to the dot. This because Bullard had sworn to do it; also because the road beyond Galesburg runs west instead of southwest, and it is easier for a train to bore straight through a gale, head on, than to take it from the quarter.

We took the big, steady curve at Princeton, a down-grade helping us, at a hundred miles an hour—so Bullard declares and what he says about engine-driving I

believe. Indeed, these great bursts can be measured only by the subtle senses of an expert, since no registering instrument has been devised to make reliable record. Across the twin high bridges that span the Bureau creeks we shot with a rush that left the reverberations far back in the night like two short barks. And just as we rounded a curve before these bridges I saw a black face peering down from the boiler-top, while a voice called out: "Wahr—wahr—wahr—wahr!" To which startling apparition Bullard, undisturbed, replied: "Wahr—wahr—wahr—wahr!" Then the head disappeared. Dan, from his side, was telling Bullard that he had seen the safety-light for the bridges, and Bullard was answering something about hitting it up harder. How these men understand each other in such tumult is a mystery to one with ordinary hearing, but somehow they manage it.

Half way between Kewanee and Galva a white light came suddenly into view far ahead. I knew it for the headlight of a locomotive coming toward us on the parallel track. Already we had met two or three trains, and swept past them with a smashing of sound and air. But this headlight seemed different from the others, paler in its luster, not so steady in its glare. The ordinary locomotive comes at you with a calm, staring yellow eye that grows until it gets to be a huge full moon. But it comes gradually, without much jumping or wavering. This light danced and flashed like a great white diamond. I watched it with a certain fascination, and as it came nearer and nearer, realized that here was a train of different kind from the others, coming down on us at terrific speed. And Bullard shouted: "Number—8—with—the—mail." Then added, as the train passed like the gleam of a knife: "She 's—going—too."

II

WE PICK UP SOME ENGINE LORE AND HEAR ABOUT THE DEATH OF GIDDINGS

THE next day, with comfortable rocking-chairs to sit in and a row of hotel windows before us, Bullard and I found time for engine chat, and I was well content. First I asked him about putting his head out of the cab window there at Greggs Hill and elsewhere. "Was it to see better?" said I.

"No," said Bullard; "it was to hear better and to smell better."

"Hear what? Smell what?"

"Hear the noises of the engine. If any little thing was working wrong, I 'd hear it. If there was any wear on the bearings, I 'd hear it. Why, if a mouse squeaked somewhere inside of 590, I guess I 'd hear it."

Then he went on to explain that the ordinary roar of the engine, which drowned everything for me, was to him an unimportant background of sound that made little impression, and left his ears free for other sounds.

"I get so accustomed to listening to an engine," he added, "that often up home, talking with my wife and child, I find myself trying to hear sounds from the round-house. And, after a run, I talk to people as if they were deaf."

"You spoke about smelling better."

"That 's right. I can smell a hot box in a minute, or oil burning. All engineers can. Why, there was—"

This led to the story of poor Giddings, killed on 590 three years before through this very necessity of putting his head out of the cab window. Giddings had Bullard's place, and was one of the most trusted men in the Burlington employ.

"You saw last night," said Bullard, "how the boiler in 590 shuts off the engineer from the fireman. And prob'ly you noticed those posts along the road that hold the tell-tale strings. They 're to warn crews on freight-car tops when it is time to duck for bridges. Well, Giddings was coming along one night between Biggsville and Gladstone—that 's about ten miles before you get to the Mississippi. He was driving her fast to make up time, sixty miles an hour easy, and he put his head out to hear and to smell, the way I 've explained it.

"There must have been a post set too near the track, and anyway 590's cab is extra wide, so the first thing he knew—and he did n't know that—his head was knocked clean off, or as good as that, and there was 590, her throttle wide open, tearing along, with a fireman stoking for all he was worth and a dead engineer hanging out the window.

"So they ran for eight miles, and Billy Maine—he was firing—never suspected anything wrong—for of course he could n't see—until they struck the Mississippi bridge at full speed. You remember crossing the bridge just before we pulled in here. It 's twenty-two hundred feet long, and we always give a long whistle before we get to it, and then slow down. That 's the law," he added, smiling, "and, besides, there 's a draw to look out for. When he heard no whistle this time, Billy Maine jumped around quick to where Giddings was, and then he saw he had a corpse for a partner."



"THEY STRUCK THE MISSISSIPPI BRIDGE AT FULL SPEED."

Another question I asked was about stopping a train at great speed for an emergency—how quickly could they do it? “I ’ve stopped,” said Bullard, “in nine hundred and fifty feet, pulling five cars that were making about sixty-two miles an hour. I don’t know what I could do with this new train, only three cars, and going eighty or ninety miles an hour. That ’s a hard proposition.”

“Would you reverse her?”

“No, sir. All engineers who know their business will agree on that. I ’d shut the throttle off, and put the brakes on full. But I would n’t reverse her. If I did, the wheels would lock in a second, and the whole business would skate ahead as if you ’d put her on ice.”

Then we talked about the nerve it takes to run an engine, and how a man can lose his nerve. It ’s like a lion-tamer who wakes up some morning and finds that he ’s afraid. Then his time has come to quit taming lions, for the beasts will know it if he does n’t, and kill him. There are men who can stand these high-speed runs for ten years, but few go beyond that term, or past the forty-five-year point. Slow-going passenger trains will do for them after that. Others break down after five years. Many engineers—skilled men, too—would rather throw up their jobs than take the run Bullard makes. Not that they feel the danger to be so much greater in pushing the speed up to seventy, eighty, or ninety miles an hour, but they simply *cannot* stand the strain of doing the thing.

“This doubling up is what breaks my heart,” said Bullard. “Since they ’ve put on their new schedule I have to divide 590 with another fellow. John Kelly takes her on the fast run East while I wait here and rest. And so I ’ve lost my sweetheart, and I don’t feel near as much interest in her as I did. You see, she ain’t

mine any more. And, between you and me," he added, confidentially, "I don't think 590 likes it much herself; you see, engines are a good deal like girls, after all."

The next night, in workman's garb again, I made my way to a gloomy round-house, ready for the run to Omaha. I was to ride the second relay, as far as Creston, on locomotive 1201, with Jake Myers in the cab, so I had been informed. Being hours ahead of time, I saw something of round-house life.

First, I followed a gaunt, black-faced Swede, with stubby beard, through his duties as locomotive hostler; saw him take the tired engines in hand, as they came in one after another from hard runs, and care for them as stable hostlers care for horses. There were fires to be dropped in the clinker-pit, coal and wood to be loaded in from the chutes, water-tanks to be filled, sand-boxes looked after, and, finally, there was the hitching fast of the weary monsters in empty stalls, whither they were led from the lumbering turn-table with the last head of steam left over dead fire-boxes. And now spoke the Swede:

"Dem big passenger-engines can werry easy climb over dem blocks and go through the brick wall," and he pointed to a great semicircle of cold engine-noses, ranged along not two feet from the round-house wall.

Later on, in the dimly lighted locker-room, I listened to round-house men swapping yarns about accidents, and to threats of a fireman touching a certain yardmaster set apart by general consent for a licking.

Finally an Irishman came in, James Byron, and for all his good-natured face he seemed in ill humor. It turned out that he had just received a hurry order to take 1201 out in Myers's place.

"Jake is sick," he said, "and they 've sent for me. But I 'm sick, too. Was in bed with the grip. Just

took ten grains of quinine. Say, I ain't any more fit to run an engine than I am to run a Sunday-school."

Then he began pulling on his overalls, while the others laughed at him, told him he was "scared" of the fast run, and said good-by with mock seriousness.

But Byron showed himself a good soldier, and soon was working over 1201 with a will, inspecting every inch of her, torch in hand, and he assured me he would take her through all right, grip or no grip.

And take her through he did. At 1.16 A.M. my old friend, locomotive 590, brought the flier up from Chicago, six minutes ahead of the schedule. Kelly had done himself proud this time. And six minutes later, on time to the minute, we drew out behind 1201, with Byron handling her and seventy tons of mail following after.

Our fireman was named Bellamy. He wore isinglass goggles against the heat, and, in his way, he was a humorist, as I discovered presently, when he came close to me (we were running at a sixty-mile gait), and, grinning like a Dante demon, remarked slowly: "Say—if—we—go—in—the—ditch—will—you—come—along?"

The first feature of this run was some trouble with a feed-pipe from the tank, which brought us to a sudden standstill in the open night with a great hissing of steam.

"What is it?" I asked of Bellamy, while Byron, grumbling maledictions, hammered under the truck.

"Check-valve stuck; water can't get into the boiler."

"How did he know it?"

"Water-gage."

"What if he had n't noticed it?"

Bellamy smiled in half contempt. "Say, if he had n't noticed it for fifteen minutes, we 'd have been sailing

over them trees about this time—in pieces. She 'd have bust her boiler."

Five minutes lost here, and we were off again, running presently into a thick fog, then into rain, and, finally, into a snow-storm. Never shall I forget the illusion, due to our great speed, that the flakes were rushing at us horizontally, shooting upward in sharp curves over the engine's headlight. And, as we swept on, the shadow of 1201 advanced beside us on the stretch of white snow as smoothly and silently as the tail of an eclipse. The engine itself was a noisy, hurrying affair, but the engine's shadow was as calm and quiet as a cloud. And I recall that the swiftness of our rush this night caused in me neither fear nor any particular emotion, although this was practically the same experience that had stirred me so the night before on 590. And I realized that riding on a swift locomotive may become a matter of course like other strange things.

III

SOME MEMORIES OF THE GREAT RECORD-BREAKING RUN FROM CHICAGO TO BUFFALO

HERE is a place in New York—the very last place one would think of—where stories without end may be heard about locomotives and the men who drive them; it is not a place of grime and steam, but a quiet and luxurious club spreading over the top floor of a very tall building on Forty-second Street, and here every day at luncheon-time railroad officials gather: superintendents, managers, and various heads of departments, men who may have grown prosperous and portly, but are always proud to talk about the boys at the throttle, and recall experiences of their own in certain exciting runs.

In the wide hall near the entrance of this Transportation Club is a driving-wheel, green painted, from the De Witt Clinton, the first locomotive that drew a passenger train in the State of New York. It is scarcely larger than a wagon-wheel, though made of iron, and an inscription sets forth how it made the historic run from Albany to Schenectady on August 9, 1831. The walls show many pictures, famous locomotives, scenes of accidents, and there are thrilling memories here in abundance if one have with him some veteran of the road to recall them.

“It’s not always the most serious accidents that frighten a man most,” remarked a high official on the New York Central, one day, while the rest of us lis-

tened. "One of the worst scares I ever had was on a freight train when there really was n't anything to be scared about. We had just pulled out of Ottumwa, Iowa, one dark night, with a caboose full of passengers, when rump—ump—bang—rip! You never heard such a racket. First one end of the car was lifted up off the rails and slammed down again, and then the other end was treated the same way; up and down we went, bump, bump, bump! and smash went the window, and out went the lights. Now, what do you suppose it was?"

"Hog under the wheels?" suggested one of the group.

"More likely a mule," said another. "There's nothing so tough as the hind leg of a mule. Is n't a car-wheel made that 'll cut through one."

"It was n't a mule or a hog, and it was n't anything alive, but it got us into a panic, all right. We waved a lantern like fury to the engineer ahead, but he did n't see it for a good while, and we just bumped along, expecting every second to be split into kindling-wood. We stopped at last, and found it was a beer-keg; yes, sir, an empty beer-keg that had got caught under the caboose between the rear axle and the bolster of the truck, and had rolled along over the ties with the car balanced on it like a man riding a rail. Was n't broken, either; no, sir, not a bit; and we had to chisel through every blamed hoop before we could get it out. Talk about making things strong—that beer-keg was a wonder!"

"I had a more exciting experience than that," said another official—he was in the freight-handling department. "It was a long time ago—yes, back in '63. I remember getting out at a station near Cincinnati to look at some soldiers, and before I knew it the train started. I was up by the engine, and as the drivers

began to turn I jumped on the cow-catcher. You see, I had often ridden there, being a railroad-man, and the engineer knew me.

"Everything went well for a few miles, and I sat on the bumper enjoying the rush of air, for it was a



"AS THE DRIVERS BEGAN TO TURN I JUMPED ON THE COW-CATCHER."

hot summer's day; but presently, as we swung around a curve, the engine gave a fearful shriek, and just ahead I saw a farmer's wagon crossing the track. There were two old men on the seat and an old white horse in the shafts. The men were so busy talking they never heard the whistle, or perhaps they were deaf. Anyhow, we were right on them before they looked up, and then they were too dazed to do anything. One of them made a grab for the reins, but I saw it was too late, and I drew my legs up off the bumper and leaned back against the end of the boiler (I must have made a picture as I crouched there); and the next second—"

"Well?" said somebody.

"Well—I guess you would n't care to hear how things looked the next second. We struck the white horse just back of his forelegs, and I had him on my lap for a hundred yards or so. No, it did n't hurt me, but it was n't pleasant. The two old men? I don't think they felt anything, it was so sudden; they just—passed out. No, I did n't see them; but I can tell you this, I 've never ridden on the cow-catcher of a locomotive since that day."

There followed some talk about fast runs, and all agreed that for out-and-out excitement there is nothing in railroading to equal a man's sensations in one of those mad bursts of speed that are ventured upon now and then by locomotives in record-breaking trials. The heart never pounds with apprehension in a real accident as it does through imminent *fear* of an accident. And so great is the nerve-strain and brain-strain upon the men who drive our ordinary fliers, that three hours at a stretch is as much as the stanchest engineer can endure running at fifty or sixty miles an hour.

"So you see," said one of the officials, "the problem of higher speeds than we have at present involves more than boiler power and strength of machinery and the swiftness of turning wheels—it involves the question of human endurance. We can build engines that will run a hundred and fifty miles an hour, but where shall we find the men to drive them? Already we have nearly reached the limit of what eyes and nerves can endure. I guess we 'll have to find a new race of men to handle these 'locomotives of the future' that they talk so much about."

He went on to consider the chance of color-blindness in an engineer, and told how the men's eyes are regularly tested by experts, who put before them skeins

of various-colored yarns, and make them pick out green from red, and so on. It is not pleasant to think what might happen if an engineer's eyes should suddenly fail him, and he should mistake the danger light for safety and go ahead at some critical moment instead of stopping. Nor does one like to fancy what might happen if an engineer should go mad at his post.

"I know one case where an engineer *did* go mad," remarked a superintendent. "He was one of our most experienced men, and had held the throttle for years on the fastest trains. Then, one Sunday, for no reason at all, he went to the round-house, got out the 'pony' locomotive—that's the one fixed up with a little parlor over the boiler, and easy-chairs and polished wood—it makes a pretty observation-car for big officials. Well, he got her out and started lickety-split up the main line, running wild and without orders. He stopped at Mott Haven, and told the men he wanted the 'pony' rebuilt and silver-plated—crazy as a loon, you see. Yes, he's in the asylum now, poor fellow; that was his last run."

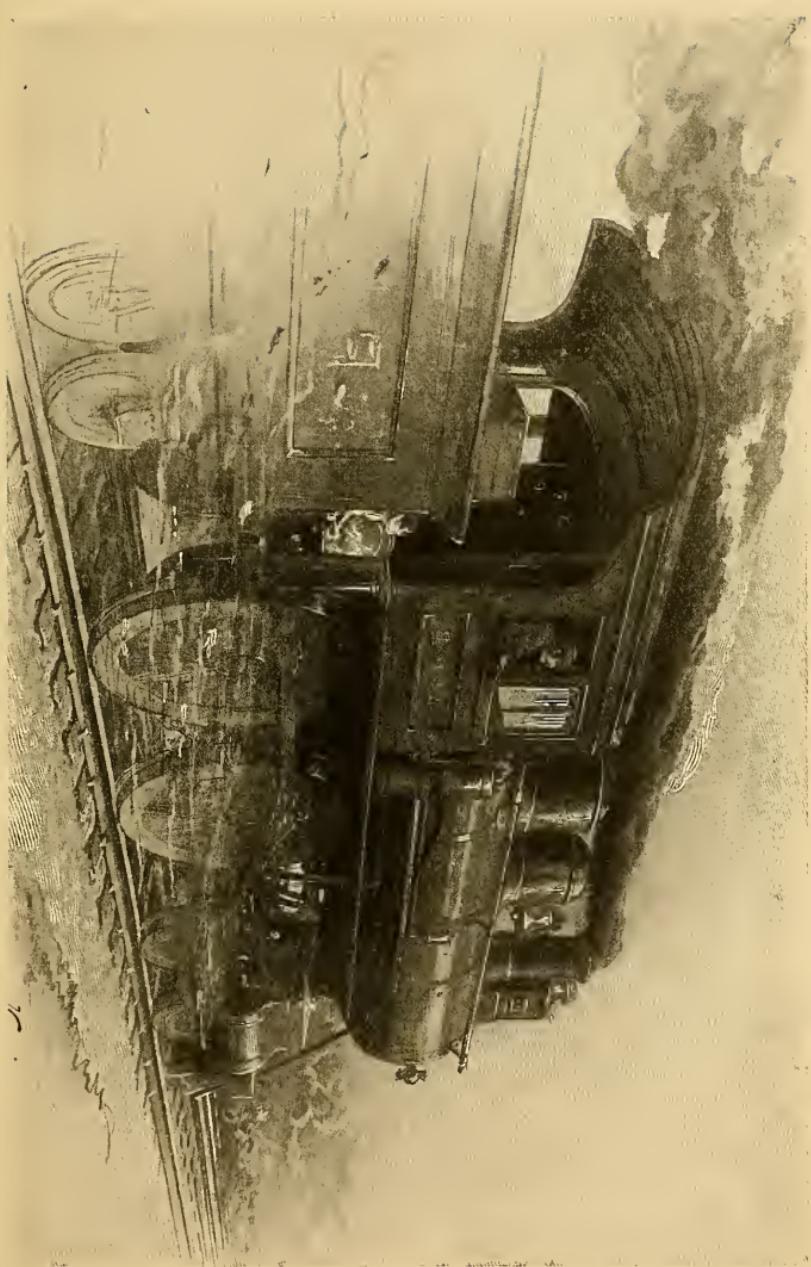
After this one of the group gave his memories of the famous speed trial on the Lake Shore road, when five locomotives in relays, driven by picked men, set out to beat all records in a run of 510 miles from Chicago to Buffalo. This was in October, 1895, and I suppose such elaborate preparations for a dash over the rails were never made. All traffic was suspended for the passage of this racing special; every railroad crossing between Chicago and Buffalo was patrolled by a section-man—that alone meant thirteen hundred guards; and every switch was spiked half an hour before the train was due. The chief officials of the Lake Shore road proposed to ride this race in person, and, if possible, smash the New York Central's then recent

world's record of 63.61 miles an hour, including all stops, over the 436½ miles between New York and Buffalo. They had before them a longer run than that, and hoped to score a greater average speed per mile; but they wished to come through alive, and were taking no chances.

It was half-past three in the morning, and frosty weather, when the train started from Chicago, with Mark Floyd at the throttle, and various important people—general managers, superintendents, editors, etc.—on the cars behind. There were two parlor-coaches, weighing 92,500 pounds each, and a millionaire's private car, one of the finest and heaviest in the country, weighing 119,500 pounds, which made a total load, counting engine and train, of something over two hundred tons.

The first relay was 87 miles to Elkhart, Indiana, and the schedule they hoped to follow required that they cover this distance in 78 minutes, including nine "slow-downs." Eighty-seven miles in 78 minutes was well enough; but the superintendent of the Western Division had set his heart on doing it in 75 minutes, and had promised Mark Floyd two hundred good cigars for every quarter of a minute he could cut under that time. But alas for human plans! Between up grades and the darkness they pulled into Elkhart at five minutes to five, which was 85 minutes for the 87 miles—not bad going, but it left them seven minutes behind the schedule, and left Mark to console himself with his old clay pipe.

One hundred and thirty-one seconds were lost at Elkhart in changing locomotives, and it was three minutes to five when big 599, with Dave Luce in the cab, turned her nose toward the dawning day and started for Toledo, 133 miles away. Great things were ex-



A RECORD BREAKING RUN.

pected in this relay, for about half of it was straight as a bird's flight and down grade, too, so that hopes were high of making up lost time, especially as Luce had the reputation of stopping at nothing when it was a question of "getting there." He certainly did wonders, and five minutes after the start he had the train at a 62-mile gait, and ten minutes later at a 67-mile gait. Then they struck frost on the rails and the speed dropped, while the time-takers studied their stop-watches with serious faces.

At ten minutes to six they reached Waterloo and the long, straight stretch. As they whizzed past the station, Dave pulled open his throttle to the last notch and yelled to his fireman. Here was where they had to *do things*. Butler was $7\frac{1}{2}$ miles away, the first town in the down grade, and they made it in 6 minutes and 40 seconds, nearly 68 miles an hour. In the next 7 miles Dave pushed her up to 70 an hour, then to $72\frac{1}{2}$, and let her out in a great burst which made the passengers sit up, and showed for several miles a top-notch rate of 87 miles an hour. Nevertheless, taking account of frost and slow-downs, they barely finished the relay on schedule time, so that for the whole run they were still seven minutes behind time; the schedule they had set themselves called for such tremendous speed that it seemed almost impossible to make up a single lost minute.

The third relay was 108 miles to Cleveland, and they did it in 104 minutes, including many slow-downs and a heart-breaking loss of four minutes when a section-hand red-flagged the train and brought it to a dead stop from a 70-mile gait because he had found a broken rail. The officials were in such a state of tension that they would almost have preferred chancing it on the rail to losing those four minutes. There is a point of

eagerness in railroad racing where it seems nothing to risk one's life!

The train drew out of Cleveland 19 minutes behind the time they should have made for a world's record. Every man had done his best, every locomotive had worked its hardest, but fate seemed against them and hopes of beating the Central's fast run were fading rapidly. The fourth relay was to Erie, $95\frac{1}{2}$ miles, and some said that Jake Gardner with 598 might pull them out of the hole, but the others shook their heads. At any rate, Jake did better than those who had preceded him, and he danced that train along at 75, 80, 84 miles an hour, so the watches said, and averaged 67 miles an hour for the whole relay.

"It 's the kind of thing that makes you taste your heart, and packs a week into ten minutes," said the superintendent, telling about it. "You may take *one* ride smashing around curves at 80 miles an hour, but you 'll never take another."

Still, in spite of these brave efforts, they pulled out of Erie 15 minutes late, and started on the last relay with gloomy faces. It was 86 miles to Buffalo, the end of the race, and they must be there by eleven thirty-one to win, which called for an average speed of over 70 miles an hour, including slow-downs. No train in the world had ever approached such an average, and their own racing average since leaving Chicago was much below it. So what hope was there?

There was hope in a tall, sparely built man named Bill Tunkey, whom nobody knew much about except that he was a good engineer with a rather clumsy ten-wheel locomotive not considered very desirable in a race. All the other locomotives had been eight-wheelers. Still, the new engine had one advantage, that she carried water enough in her tank for the whole

run, and need not slow up to refill, as the others had done. She had another advantage—that she carried Tunkey, one of those men who rise up in sudden emergencies and *do* things, whether they are possible or not. It was not possible, everybody vowed, to reach Buffalo Creek by eleven thirty-one. "All right," said Tunkey, quietly, and then—

Within forty rods of the start he had his engine going 30 miles an hour, and he pressed her harder and harder until 11 miles out of Erie she struck an 80-mile pace, and held it as far as Brockton, when she put forth all her strength and did a burst of 5 miles in 3½ minutes, one of these miles at the rate of 92½ miles an hour, as the watches showed. "And I never want any more of that in mine," said the superintendent.

The next town was Dunkirk, where a local ordinance put a 10-mile limit on the speed of trains. Tunkey smiled as they roared past the station at more than 80. A crowd lined the tracks here, for the telegraph had carried ahead the news of a hair-raising run. That crowd was only a blur to staring, frightened eyes at the car-windows. The officials were beginning to realize what kind of an engineer they had ahead this time. Whizzzzz! How they did run! Wahr! Wahr! barked the little bridges and were left behind! H-o-o-o! bellowed a tunnel. And rip, whrrr! as they slammed around a double reverse curve with a vicious swing that made the bolts rattle in the last car. Men put their mouths to other men's ears and tried to say that perhaps Mr. Tunkey was getting a *little* overzealous. Much good that did! Mr. Tunkey had the bit in his teeth now and was playing the game alone.

At eleven-six they swept past Silver Creek with 29 miles to go and 25 minutes to make it in. Hurrah! They had made up time enough to save them!

At eleven-twenty they passed Lake View.

"Twelve miles more, and 11 minutes," yelled somebody, waving his hat.

"Toboggan-slide all the way," yelled somebody else.
"We 'll do it easy. Hooray!"

They passed Athol Springs at eleven-twenty-four, all mad with excitement. They had 7 minutes left for 8 miles, and were cheering already.

"We 'll make it with half a minute to spare," said the only man in the private car who was reasonably cool. He was six seconds out of the way, for they crossed the line twenty-six seconds before eleven thirty-one, and won the race by less than half a minute, beating the New York Central's record per mile on the whole run by the fraction of a second, and beating the whole world's record in the last relay by several minutes, the figures standing—*Tunkey's* figures—86 miles from Erie to Buffalo in 70 minutes and 46 seconds, or an average speed of 72.91 miles an hour.

"Do?" said the official. "What did we do? Why, we—we—" He paused helplessly, and then added, with a grin: "Well, we did n't do a thing to *Tunkey*!"

IV

WE HEAR SOME THRILLING STORIES AT A ROUND-HOUSE AND REACH THE END OF THE BOOK

IT was in the round-house at Forty-fifth Street, a place of drip and steam and oil smears, that I listened to Bronson and Lewis, two good men at the throttle, as they held forth on the subject of killing people with an engine.

“After all, it’s an easy death,” said Bronson.

“I know,” said Lewis; “but I don’t like it, just the same—I mean killing ‘em.”

“Last one I killed,” observed Bronson, “was a woman, wife of a congressman, they said, all done up in furs. ‘Member her?”

“Up by New Rochelle?”

“Yes, sir, there at the platform end, where they’ve made a path over the tracks. Too lazy to follow the road, those folks are. Take a short cut and get killed. Well, this congressman’s wife, she sauntered across just as I came through with the express. Never turned her head. Never heard the whistle. Queer about women, ain’t it?”

Lewis nodded.

“Had four minutes to make up, and we were goin’ good—fifty-five an hour easy. Slammed the brake on, but—pshaw! Congressman’s wife she stopped the last second, and that settled it. If she’d taken one more step I’d have scraped by her, but she stopped. Had to kill her. What’s a man to do?”

"Why did she stop?" I asked.

"Oh, some idea. Prob'lly forgot where she was. ~~she~~ lady. Makes a man sick."

"Tell ye what I think," said Lewis. "I think there's omen start across a track to take a chance. If they et hit it's all right, and if they don't it's all right. Same as girls pull leaves off a flower to see if some fellow loves 'em. There was—"

"She did n't do that," put in Bronson.

"I don't say she did, but some might. There was a woman up at Larchmont walked across in front of me the other day. Had a baby, too, in her arms. Now, why should a woman start over four tracks just as I was coming, and walk slow, if she did n't want to take a chance? Mind you, I was on the far side, and she had to cross three tracks before she got to mine. And all the time I had the whistle wide open. Why, a dog would have heard that whistle and got out o' the way."

"Did you—" I began.

"Hit her? I did n't know at the time, it was such a close call. Thought I had, but I found out afterward she got past—by the skin of her teeth. Bet you she'd had some trouble. Thought she might as well quit the game and take the baby along. Then, mebbe, she was glad when she got across safe."

"Can't tell," reflected Bronson.

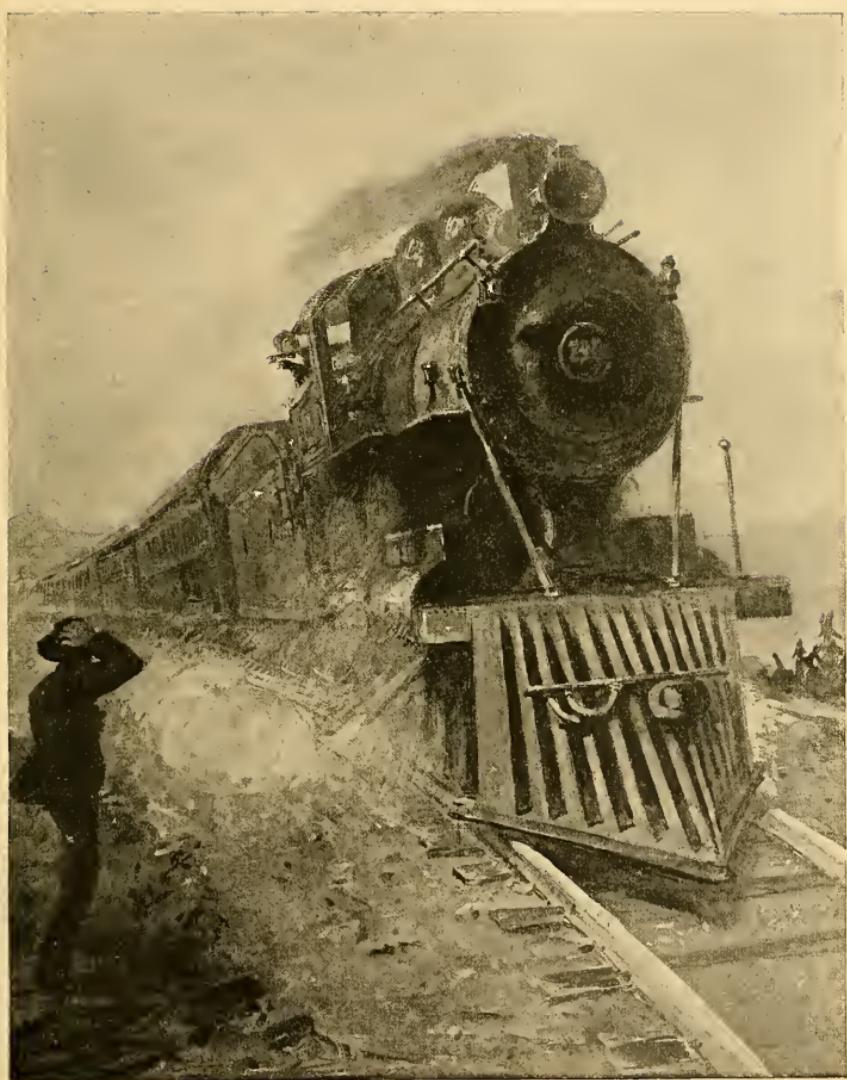
"I b'lieve there's such a thing as people getting drawn to a train. I don't mean by the suction, but ~~wn~~ by the idea of its going so blamed fast and being strong, especially people sick or down on their luck. Now, last year I was coming through Rye one morning, and as I struck the bridge after that reverse curve I saw two young fellows running along the No. 3 track away from me. I was on No. 1 track, so they were all

right, but as I came up they both swung over to No. 1, and I cut 'em all to bits. Turned out they were a couple of lads that had tramped it down from Boston, goin' to enlist. They were weak and hungry, and I think they just gave up to the train because they could n't help it."

"Might be," said Bronson.

"Tell ye who was the nerviest man I ever killed," went on Lewis. "Fellow in West Haven. Say, but we were coming that night! Northampton express, ye know, and a down grade over the salt meadows. First thing I knew a man was standing at the side of the track, fairly close, but not where he 'd get hit. I thought he was some friend of mine in West Haven trying to make me whistle. But when I got near him, say a hundred feet away, he stepped out between the rails and stood there a few seconds with his arms lifted and a smile on his face—quite a pretty smile. Then, just as I was on him he turned and knelt between the rails. I got the brakes on quick as I could, emergency and everything, but I could n't stop her in less than a length and a half, and—well, I guess you don't want to know what that engine looked like when I went over her."

"I know," said Bronson, "they scatter something terrible. Say, I 've noticed that sort of pleasant look in their faces, too. Once I was waiting on a siding, and a man came up and spoke to me very polite, and wanted to know if I 'd please give him a drink of water. I told him the water in my tank was too warm to drink, but I let him have my cup and showed him where there was a spring right near. He thanked me and walked over to it, and I watched him bend down and take two good drinks, then he brought the cup back and thanked me again.



“DRAWN BY THE IDEA OF ITS GOING SO BLAMED FAST AND BEING SO STRONG.”

“ ‘Any train along here soon?’ he asked.

“ ‘Which way?’ said I.

“ ‘Don’t matter which way,’ said he.

“ ‘There’s an up train due now,’ said I; ‘she’s the one I’m waiting for.’

“ ‘Is she a fast train?’ he asked.

“ ‘Fair,’ said I; ‘bout fifty an hour along here.’

“ ‘That’s good,’ said he, and I wondered what he meant. He seemed like a nice man.

“Pretty soon along came the up train, and I saw him run down the track to meet her. Then he stopped, faced sideways, and let himself fall square across the rails. Say, I was mighty glad I’d fixed it so he had that drink of water. That was his last drink.”

“Queer how they like to be hit by a fast express,” reflected Lewis, “when a slow freight would do just as well. Now, that man at West Haven, the one who took it kneeling down, he’d waited around the tracks all day—the section-gang saw him—and he was n’t doing a thing but picking out a train fast enough for him. He’d stand ready for one, but when she’d turn out to be an accommodation or something slow he’d step away. Did n’t propose to shake hands with anything under fifty an hour. Mine was the first one suited him.”

“Do you ever think of their faces?” I asked; “ever see them at night—the way they looked when you struck them!”

“No,” said Bronson; “can’t say I ever do.”

Neither did Lewis. And I judge that engine-drivers are not deeply affected by these sad occurrences. Which is fortunate, for few escape them. Indeed, in going about from engine to engine I found the following dialogue repeated over and over again:

“Ever in a collision?”

"No, sir."

"Ever go off the track?"

"No, sir."

"Ever kill anybody?"

"Oh, yes. Why, only last week I struck a—" Then would follow a story of sudden death. And they all spoke in a kindly but matter-of-fact way, as if these swift executions were part of their business. And I have it from a veteran that any engine-driver would sooner hit a man than a hog, for a hog is very apt to wreck the train; a hog is worse than a horse, whereas a man makes no trouble; he simply gets killed.

Near the roaring round-house at Mott Haven is another interesting place—the "Young Men's Christian Association Car," which is not a car at all, but a dingy shed built of four cars, and serving as lunch-room, wash-room, reading-room, and sleeping-room for men of the trains. This is a homely refuge spot, where any morning we may meet engineers resting after a hard night's run or making ready to go out again. Let us drop in and join one of the groups.

Here is a man telling about the mad run "Big Arthur" made the other night down from Albany. We get just the tail of the story: "So the superintendent he ripped around about how they were twenty-seven minutes late, and Big Arthur he sat in the cab and never said a word. 'Now,' says the superintendent, rather sarcastic, 'I suppose you know this is the Empire State Express you 're running?' 'Yep,' says Big Arthur. 'Well, do you know what time she 's supposed to pull into the Grand Central?' 'Yep,' says Big Arthur again, and that 's all he did say; but, holy smoke! how they went! Had those porters on the private car scared green! A hundred miles an hour some o' the way, and they came in on time to the dot. Oh, you

can't beat these new engines with the fire-box over the trailer; but say, was n't that great when Big Arthur snapped out 'Yep' to the old man?"

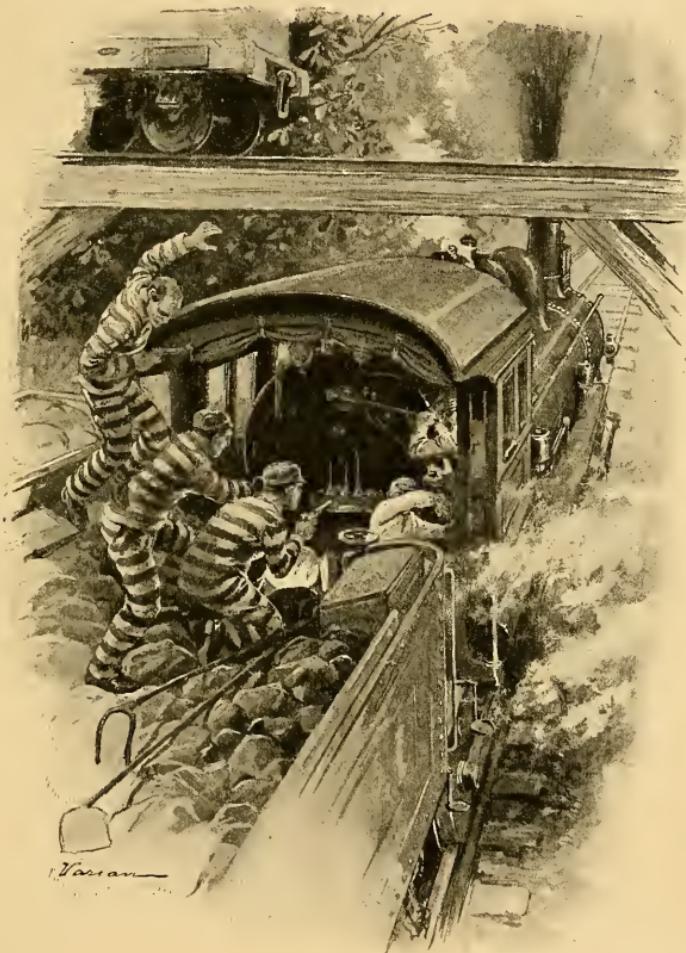
I asked if I might see Big Arthur, and one of the engineers said he 'd be along pretty soon, and in the meantime he told me about the individuality of locomotives: how one is good-tempered and willing, while another is cranky; how the same locomotive will act differently at different times, just as people have whims, and how some locomotives are fated to ill luck, so that nobody wants to drive them.

"Take these ten new engines the company 's just put on. They 're the finest and strongest made, a whole lot better than the ones we 've thought were wonders on the Empire State. They 're beauties, and all exactly alike, measurements all the same; but every one of 'em has its own points, good and bad. One will go faster than another with just the same steam. One will pull a heavier load with less coal. And very likely there 'll be some kind of a hoodoo on one of 'em. Takes time, though, to find out these things. It 's like getting acquainted with a man."

Other men came in now, and the talk changed to accidents. I asked if an engineer plans ahead what he will do in a collision. It seemed reasonable that a man always under such menace would have settled his mind on some prospective action. But they laughed at the idea, and declared that an engineer can no more tell how he will act in an emergency than the ordinary citizen can say what he would do in a fire, or how he would meet a burglar. One engineer would jump, another would stick to his throttle, and the chances of being killed were as good one way as the other.

The mention of a burglar led one of the new-comers to tell of William Powell's adventure with some Sing

Sing convicts. Powell was the oldest engineer on the New York Central. He died a year ago, and this



"CONVICTS HAD REVOLVERS ALL RIGHT THAT TRIP AND DENNY THREW UP HIS HANDS."

thing happened back in the seventies. It seems there was a trestle over the track about half a mile below the Sing Sing station, and on this trestle some convicts working in the quarry used to run little cars loaded with stone and dump them into the larger cars under-

neath. Of course, they worked under the surveillance of well-armed guards.

On one occasion, however, four or five convicts outwitted the guards by dropping from the trestle upon the tender of a moving locomotive, and the first thing the engineer knew he was set upon by a band of desperate men, who covered him and his fireman with revolvers. At the same moment half a dozen shots rang out, and bullets came crashing through the cab sides from the guards firing at random after the fleeing engine. Altogether it was quite the reverse of pleasant for William Powell.

"Out you go now, quick!" said the convicts; "we 'll run this engine ourselves."

The engine was No. 105, Powell's pride and pet, and he could not bear to have unregenerate hands laid upon her, so he spoke up very politely: "Let me run her for you, gentlemen; I 'll go wherever you say."

They agreed to this, and some distance down the line left the engine and departed into the woods.

"And the joke of it was," concluded the narrator, "that the revolvers those convicts had were made of wood painted black, and could n't shoot any more than the end of a broom! It was a big bluff, but it worked."

"Was n't any bluff when Denny Cassin got held up at Sing Sing," said another engineer. "Convicts had revolvers all right that trip, and Denny threw up his hands same as any man would. That was twenty years ago, on old engine 89. It was right at the Sing Sing station, and three of 'em jumped into the cab all of a sudden and told Denny to open her up, and you bet he did. Then they told him to jump, and he jumped; but first he managed to fix her tank-valves so she 'd pump herself full of water and stop before she 'd

gone far. That was Denny's great scheme, and he walked along laughing to think how mad those convicts would be in a few minutes.

"It turned out, though, that Denny spoiled a nice trap they 'd laid up at Tarrytown to catch those fellows when they got there. You see, the telegraph operator wired up the line that a runaway locomotive was coming with three escaped convicts on her, and the train despatcher at Tarrytown just set the switch so the locomotive would sail plump over a twelve-foot stone embankment down into the Hudson River. That 's what would have happened to those convicts if Denny had left his tank-valves alone, but, of course, 89 got water-logged long before she reached Tarrytown; she just kicked out her cylinder-ends a few miles up the track and stopped. Then the convicts climbed down and skipped away. Two of 'em got caught afterward, but there was one they never caught."

Presently somebody reported that Big Arthur was out in the round-house, getting 2994 ready to take out the Empire State. It was clear enough that Big Arthur was an important figure in the eyes of these begrimed men, and, setting forth across the yards, I came upon him presently, torch in hand, looking over his deep, purring locomotive against the dangers of the run. Another engineer by the fire-box was discussing a theory of some of the boys, that a man can run his locomotive by his sense of time as well as by a watch.

"Denny Cassin says he 'd agree to take the Empire State from Albany to New York and keep her right on the dot all the way, and bring her in on the minute, just by *feeling*. What d' ye think of that?"

"That 's possible," said Big Arthur. "A man can feel how fast he 's going. He 's *got* to judge big speed

by feeling, for there ain't any speed-recorder that 's much good, say above ninety miles an hour."

At the first opportunity I explained to Big Arthur and his friend that I would very much like to draw upon their experience for some thrilling incidents in engine-driving.

"Tell him about the time you went in the river," suggested Big Arthur.

"That was 'way back in '69," said the other, "when I was firing for 'Boney' Cassin, the brother of Denny. It was in winter, a bitter cold day, and the Hudson was so gorged with ice that part of the jam had squeezed over the bank and torn away our tracks. So pretty soon, when we came along with twenty-three cars of a train of merchandise, why in we went, and the old engine 'Troy' just skated ahead on her side into the river, smash through the ice, down to the bottom, and pulled thirteen cars after her.

"You could n't see a piece of that engine above water as big as your hand, and how I got out alive is more than I know. Guess I must have jumped. Anyhow, there I was on the broken floe, and I could hear the old Troy grinding away in the river, churning up water and ice like a crazy sea-serpent. She struggled for nearly a minute before her steam was cold and her strength gone. Then she lay still, dead.

"I looked around for Boney; and at first I did n't see him. I thought he 'd gone down sure, and so he had; but just as I was looking I saw a big black thing heave up through the ice, and I heard a queer cry. Well, that was Providence, sure! It seems the engine had ripped her cab clean off as she tore through the ice, and here was the cab coming up bottom side first, with Boney inside hanging on to a brace and almost dead. I hauled him out, and then we scrambled ashore over the wrecked cars. They were full of flour, and

the barrels were all busted open, so by the time we reached the bank we looked like a twin Santa Claus made of paste, and three quarters drowned at that."

"But Boney stuck to his throttle," I remarked.

"Yes," said the other, "he stuck to his throttle. The boys generally do."

After this I asked Big Arthur for a story, but he assured me he could n't think of anything special.

"Tell about that woman on Eleventh Avenue," said his friend.

"Yes," said I, "tell about her."

"Oh," said Big Arthur, "that was n't much. I was pulling a freight train down Eleventh Avenue one day, going slow through the city, and at Thirty-fifth Street a woman turned down the track ahead of me. I whistled, but she never heard me. She was going marketting, and could n't think of anything else. I saw I 'd strike her sure—there was n't time to stop—so I ran along the boiler-side to the pilot, and got there just as we were on her. Another second and she 'd have been under the wheels. I braced myself and made a jump at the woman, and struck her back of the neck with a shove that sent her sprawling off the track, with me after her. You see, I had to jump hard or I 'd have stayed on the track myself and gone under the engine."

"Did it end in a romance?" I asked.

"Romance nothing!" exclaimed Big Arthur. "That woman got up so mad—why, she called me names and clawed the skin off my face until—well, I could n't get shaved for three weeks afterward. In about a minute, though, she cooled off, and somebody told her I 'd saved her life—which I had—and then, sir, blamed if she did n't go down on her knees and try to kiss my feet, and pray I 'd forgive her. Say, that 's the only time I ever got prayed to."

Here Big Arthur's fireman whispered something to

him, and the engineer nodded. "That 's so, that 's a good story," and then he told how an old lady of seventy-five saved a New York Central express some years ago at Underhill Cut, about a mile south of Garrisons.

"She 's a relative of my fireman, so I know the thing 's true; besides that, the company gave her three hundred dollars. You see, it all happened one winter night, and this Mrs. Groves—that 's her name—was the only person near enough to do anything. She lived in a little house beside Underhill Cut, and about four o'clock in the morning she heard a frightful crash, and there was a freight train wrecked right in the cut, and cars piled up three or four deep over the tracks! She knew the express might come along any minute, and of course it was a case of everybody killed if they ever struck that smash-up. So what does she do, this little old lady, but grab up a red petticoat and a kerosene lamp, and run out as fast as she could in her bare feet,—yes, sir, and nothing on but her night-gown,—right through the snow. That 's the kind of a woman *she* was.

"Well, she went down the track until she heard the express coming, and then she took her red petticoat and held it up in front of the lamp so as to make a red light. And, what 's more, it worked! The engineer saw the danger signal, slammed on his brakes, and stopped the train a few car-lengths from the wreck. Yes, sir, only a few car-lengths!"

Big Arthur nodded thoughtfully, and climbed into the cab. It was time to go.

IN ending this chapter now, and with it the present series, I venture the opinion that the men who follow these Careers of Danger and Daring—the divers, steeple-climbers, and the rest—are very little different from

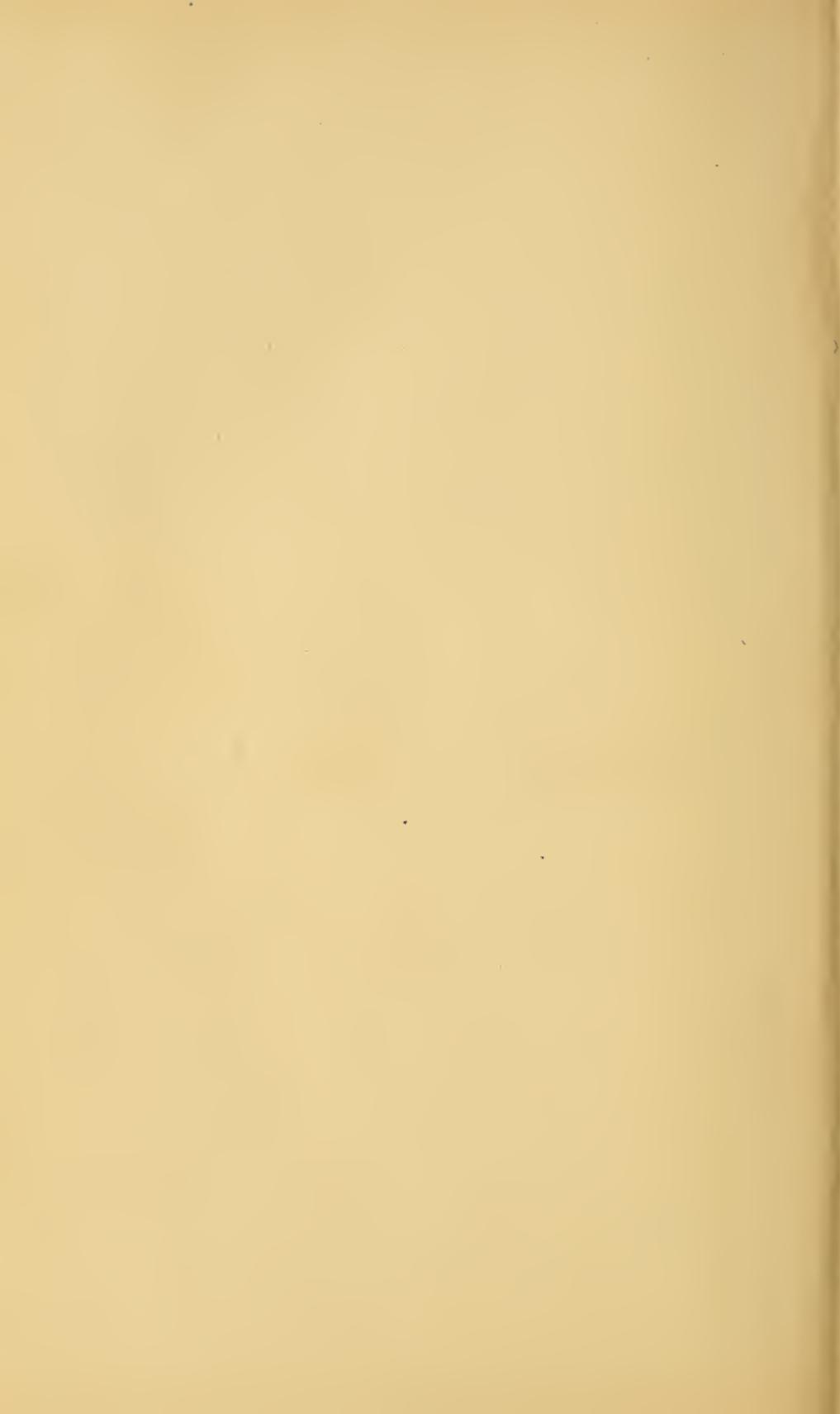
their fellow-men, except as they have developed certain faculties by their exercise, and established in themselves the *habit of courage*. They were not born with any longing to do these daring acts, nor with any particular aptitude for them. They have been guided nearly always by the drift of life and by opportunities that presented. As to fear, they have the same capacity for it that we all have, and are serene in their peril only because they feel themselves, by their patience and skill, well armed against it. The steeple-climber would be afraid to go down in a diving-suit, the lion-tamer would be afraid to go up in a balloon, the pilot would be afraid to swing on the flying-bars, and so on.

I will even go further, and say that the average good citizen who is sound of body has as great capacity for courage as any of these men. He could develop it if he cared to; he would develop it if he had to. That is the main point, after all: these men *must* be brave, they *must* conquer their fear, and the only trouble with the average man is that nothing ever occurs to show him and those who know him what fine things he could do if the pressure were put upon him. Yet any day the test may come to any one of us—pain to bear, losses to bear, bereavement to bear. And then the *great* test.

Well, perhaps these humble heroes whose lives we have glanced at may give us a bit of their spirit for our own lives, the brave and patient spirit that will keep us unflinchingly at the hard thing, whatever it be, until we have conquered it. And perhaps we too may feel impelled to cultivate the habit of courage. That would be a fine inspiration indeed, and I can only hope that my readers may feel it.

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